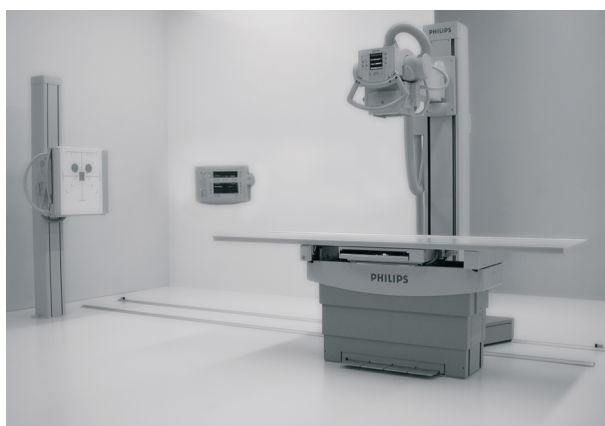


BuckyDiagnost IsoRAD Floor System

Level 0 Documentation (SRM)



DMC Hamburg

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(06.0)

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Manual Order No. 4512 988 01711 REV AA
4512 983 09181

HISTORY, RECORD

1 ►

RECORD OF SYSTEM PROGRAMMING

2 ►

RECORD OF DEFAULT USER PROGRAMS

3 ►

RECORD OF RECOMMENDED SETTINGS

4 ►

RECORD OF MEASURED DATA

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Section 1

History record

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Section 2

Record of system programming

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- 2. XRG-IsoRAD RGDV programming**
- 3.**



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X-Scope configuration

1. Program Manual BuckyDiagnost.

The following table contains the X-Scope configuration of a BuckyDiagnost IsoRAD system.

Note

The values can be different depending on software version or order configuration.

Software programming will be carried out by the connected PC and the Service Software X-Scope.

Connect PC to bucky controller SZ1X20.

1.1 Program Manual

Fill out step by step the following table.

Take note of the help screens.

The following tables refer to Bucky Controller Firmware R9.2.

INSTALL / Program Manual / bucky RAD (Settings)	Date:
Installation Data	
Install Date (dd/mm/yy)	
Hospital Name	US Military, BuckyDiagnost IsoRAD Floor System
Road	
City	
Country	USA

System Configuratuon			
	Factory, initially	Actual values	Remarks
Bucky Date (dd/mm/yy)			
Bucky Time (hh:mm:ss)			
Bucky System Type	<input type="checkbox"/> BUCO+OWI	<input type="checkbox"/>	
Bucky System Type	<input checked="" type="checkbox"/> BUCO	<input type="checkbox"/>	
Bucky System Type	<input type="checkbox"/> DIDI	<input type="checkbox"/>	
	<input type="checkbox"/> DIDI+OWI	<input type="checkbox"/>	
User Language	<input checked="" type="checkbox"/> English	<input type="checkbox"/>	
	<input type="checkbox"/> German	<input type="checkbox"/>	
	<input type="checkbox"/> French	<input type="checkbox"/>	
	<input type="checkbox"/> Spanish	<input type="checkbox"/>	
Display Units	<input type="checkbox"/> Metric [cm]	<input type="checkbox"/>	
	<input checked="" type="checkbox"/> Imperial ["]	<input type="checkbox"/>	
Cassette Size	<input type="checkbox"/> Metric [cm]	<input type="checkbox"/>	
	<input checked="" type="checkbox"/> Imperial ["]	<input type="checkbox"/>	
Amplimat Thresh. [0.1 mm]	2200		
PBL [+ve Beam Limiting]	<input type="checkbox"/> No	<input type="checkbox"/>	
	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/>	
Workstation-Fail Fallback	<input checked="" type="checkbox"/> No	<input type="checkbox"/>	not available for bucky
	<input type="checkbox"/> Yes	<input type="checkbox"/>	

Room Configuration			
	Factory, initially	Actual values	Remarks
XRG Reg Dev key map	<input checked="" type="checkbox"/> Set A (Upper4)	<input type="checkbox"/>	not available for bucky
	<input type="checkbox"/> Set B (Lower4)	<input type="checkbox"/>	
	<input type="checkbox"/> Customised	<input type="checkbox"/>	
Table exposures	<input type="checkbox"/> No	<input type="checkbox"/>	
	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/>	
Wall Stand exposures	<input type="checkbox"/> No	<input type="checkbox"/>	
	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/>	
Tomography exposures	<input checked="" type="checkbox"/> No	<input type="checkbox"/>	
	<input type="checkbox"/> Yes	<input type="checkbox"/>	
Free Cassette exposures	<input type="checkbox"/> No	<input type="checkbox"/>	
	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/>	
Vertical Tracking Inst.	<input checked="" type="checkbox"/> No	<input type="checkbox"/>	
	<input type="checkbox"/> Yes	<input type="checkbox"/>	

Control Handle			
Control Handle Type	<input type="checkbox"/> Standard	<input type="checkbox"/>	
	<input checked="" type="checkbox"/> Options (+dis	<input type="checkbox"/>	
Filter Key Enable	<input type="checkbox"/> No	<input type="checkbox"/>	
	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/>	
Key – Switch Enable	<input type="checkbox"/> No	<input type="checkbox"/>	
	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/>	
Man SID Beep (.1 sec)	1		
Slit Light installed	<input type="checkbox"/> None	<input type="checkbox"/>	
	<input type="checkbox"/> Restricted	<input type="checkbox"/>	
	<input checked="" type="checkbox"/> Full Function	<input type="checkbox"/>	
Slit Light delay (sec)	30		
Slit Light by Workstation	<input checked="" type="checkbox"/> No	<input type="checkbox"/>	not available for bucky
	<input type="checkbox"/> Yes	<input type="checkbox"/>	

Collimator			
Collimator type	<input type="checkbox"/> Manual	<input type="checkbox"/>	
	<input type="checkbox"/> Galileo	<input type="checkbox"/>	
	<input checked="" type="checkbox"/> NICOL	<input type="checkbox"/>	
Focus depth [mm]	64		
RAD angle [0,1]	144		
Man. coll. speed [mm/sec]	60		
Sim Light delay (sec)	30		
Sim Light by Workstation	<input checked="" type="checkbox"/> No	<input type="checkbox"/>	not available for bucky
	<input type="checkbox"/> Yes	<input type="checkbox"/>	

Ceiling Suspension			
Ceiling Suspension Type	<input type="checkbox"/> CS2 (2m)	<input type="checkbox"/>	
	<input type="checkbox"/> CS4 (4m)	<input type="checkbox"/>	
	<input type="checkbox"/> CE (economy)	<input type="checkbox"/>	
	<input checked="" type="checkbox"/> Floor Stand	<input type="checkbox"/>	
Long position sensors	<input type="checkbox"/> No	<input type="checkbox"/>	
	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/>	
Trans position sensors	<input checked="" type="checkbox"/> No	<input type="checkbox"/>	
	<input type="checkbox"/> Yes	<input type="checkbox"/>	

Table			
	Factory, initially	Actual values	Remarks
Bucky Device Type	<input checked="" type="checkbox"/> Manual (New)	<input type="checkbox"/>	
	<input type="checkbox"/> Automatic	<input type="checkbox"/>	
	<input type="checkbox"/> ACL4	<input type="checkbox"/>	
	<input type="checkbox"/> Manual (Old)	<input type="checkbox"/>	
Cassette Sensing	<input type="checkbox"/> No	<input type="checkbox"/>	
	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/>	
Receptor Offset (0.1 mm)	0		0 ... 100 default : 0
Height Sensing Installed	<input type="checkbox"/> No	<input type="checkbox"/>	
	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/>	
Fix Floor Film Hgt (mm)			not available for TH2
Table-Image Dist (mm)	82		

Wall Stand / Basic setup ...			
Wall Stand Type	<input checked="" type="checkbox"/> VE (economy)	<input type="checkbox"/>	
	<input type="checkbox"/> VT (tilt)	<input type="checkbox"/>	
	<input type="checkbox"/> VS (vert. mot.)	<input type="checkbox"/>	
	<input type="checkbox"/> VS (both mot.)	<input type="checkbox"/>	
	<input type="checkbox"/> VS (tilt motori.)	<input type="checkbox"/>	
Bucky Device Type	<input checked="" type="checkbox"/> Manual (New)	<input type="checkbox"/>	
	<input type="checkbox"/> Manual (Old)	<input type="checkbox"/>	
	<input type="checkbox"/> Automatic	<input type="checkbox"/>	
	<input type="checkbox"/> ACL4	<input type="checkbox"/>	
	<input type="checkbox"/> BUF Cassette	<input type="checkbox"/>	
Bucky Device Orient	<input checked="" type="checkbox"/> Left	<input type="checkbox"/>	Only applicable for BUF Cassette
	<input type="checkbox"/> Right	<input type="checkbox"/>	
Cassette Sensing	<input type="checkbox"/> No	<input type="checkbox"/>	
	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/>	
Receptor Offset (0.1 mm)	0		
Wall Stand Position	<input type="checkbox"/> Transverse	<input type="checkbox"/>	
	<input checked="" type="checkbox"/> Longitudinal	<input type="checkbox"/>	
Height Sensing Installed	<input checked="" type="checkbox"/> No	<input type="checkbox"/>	
	<input type="checkbox"/> Yes	<input type="checkbox"/>	
Collimator Remote Ctrl.	<input checked="" type="checkbox"/> No	<input type="checkbox"/>	
	<input type="checkbox"/> Yes	<input type="checkbox"/>	
WS Default Height (mm)	410		

Error Buffer...			
Error Level	<input type="checkbox"/> Information	<input type="checkbox"/>	
	<input checked="" type="checkbox"/> Warning	<input type="checkbox"/>	
	<input type="checkbox"/> Error	<input type="checkbox"/>	
	<input type="checkbox"/> Fatal	<input type="checkbox"/>	
Reset Error Buffer?	<input checked="" type="checkbox"/> No	<input type="checkbox"/>	
	<input type="checkbox"/> Yes	<input type="checkbox"/>	



BuckyDIAGNOST FS IsoRAD with Bucky-Controller / TH2 / BuckyDIAGNOST VE	Name :	Bucky		Bucky wall stand	Free cassette				
Data Set A :	Desk :	RGDV1	RGDV2	RGDV3	RGDV4	RGDV5	RGDV6	RGDV7	RGDV8
- Room :		1		1	1				
- Tube :		1		1	1				
- Release circuit number :		do not care		do not care	do not care				
- Enable handswitch at generator desk :		yes		yes	yes				
- Syncmaster present :		yes		yes	yes				
- Exposure switch type :		double step		double step	double step				
- Bucky format density correction :		0		0	0				
- Cone density correction :		0		0	0				
- Dose measurement input :		EZ X21		EZ X31	none				
- Dose measurement sensor :		Bucky amplimat		Bucky amplimat	(Bucky amplimat)				
- Exposure series / Tomo movement :		no		no	no				
- Release delay :		enable		enable	enable				
- Mounted radiographical controller :		Bucky contr. 1 / DigitalDiagnost		Bucky contr. 1 / DigitalDiagnost	Bucky contr. 1 / DigitalDiagnost				
- Release circuit adaptation unit :		none		none	none				
- Mounted tomo extension :		none		none	none				
- Medium II format kV correction (dose equiv. steps) :		0		0	0				
- Medium II format density correction (6% steps) :		0		0	0				
- Medium II format mAs correction (6% steps) :		0		0	0				
- Small II format kV correction (dose equiv. steps) :		0		0	0				
- Small II format density correction (6% steps) :		0		0	0				
- Small II format mAs correction (6% steps) :		0		0	0				
Data Set B :									
- Used for tomo :		no		no	no				
- Used for fluoroscopy :		no		no	no				
- CT add on :		no		no	no				
- Disable time override :		no		no	no				
- Tube power factor :		100 %		100 %	100 %				
- kV steps :		Dose equiv. ¹⁾		Dose equiv. ¹⁾	Dose equiv. ¹⁾				
- mAs steps :		25 % ¹⁾		25 % ¹⁾	25 % ¹⁾				
- mA steps :		25 % ¹⁾		25 % ¹⁾	25 % ¹⁾				
- time steps :		25 % ¹⁾		25 % ¹⁾	25 % ¹⁾				
- Density steps :		12 % ¹⁾		12 % ¹⁾	12 %				
- Density correction (6% steps) :		0		0	0				
- Underexposure display :		yes		yes	yes				
- Tube overload protection :		on		on	on				

1) = has to be adjustet on site

Section 3

Record of default user programs

Contents

1. Extended APR Data table RGDV 1 – 4

2.



Section 4

Record of recommended settings

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1.



Section 5

Record of measured data

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1. Read me first
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4512 983 03211	(04.0)
4512 983 03231	(04.0)

Read me first

Read me first

System status report for manufacture and field installation

Introduction:

The Bucky system is adjusted in the factory according to the actual service documentation.

The status report list gives an overview about:

- Traceable items / system configuration.
- Settings and adjustments during the pre-installation in the factory.
- Values and ranges for acceptable deviations.
- For the final handing over to the customer the status report must be completed from the field engineer.

Contents:**1. System configuration for traceable items****2. Programming and adjustments for**

Only the marked text segments are included.

- | | | |
|--------------------------|---|--------------------------|
| <input type="checkbox"/> | BuckyDiagnost CS 2/4, FS and TraumaDiagnost | (4512 983 03191) 3 pages |
| <input type="checkbox"/> | BuckyDiagnost TH2 / TF and DigitalDiagnost TH | (4512 983 03201) 3 pages |
| <input type="checkbox"/> | BuckyDiagnost VE / VT / VR / VE2 / VT2 | (4512 983 03211) 1 page |
| 3. | General / Safety aspects | (4512 983 03231) 1 page |

NOTE

The requirements listed in this section may differ from the requirements of national regulations (e.g. RÖV).

Measured values outside this status report must be inside the limitation of national regulations. ■



factory
sidefield
side**1. Programming and adjustment**

The mechanical installation must be done in order of the installation manual.

For adjusting and programming fill out the attached list.

BuckyDiagnost CS 2/4 , FS and TraumaDiagnost**Generator + BuckyDiagnost CS 2/4**

Labelling on the keyboard

☐☐

Generator is programmed

☐☐

This programming must be checked especially for main power condition

U = 400 V R = 100 mΩ

☐

U = V R = mΩ

☐

Generator with tube 1 Type is adapted Serial No.

☐

Generator with tube 2 Type is adapted Serial No.

☐

All functions are in order with the operator manual

☐☐

AMPLIMAT function is tested L C R measuring field

☐

Insert cassette 24 cm x 30 cm (lengthways and vertical format).

All measuring fields (L, C, R) selectable.

Insert cassette 18 cm x 24 cm (lengthways and vertical format).

Only center measuring field selectable.

Emergency switch off by < 600 mAs tested

☐☐

Check of free exposure

Standard APR settings

☐☐

Individual APR settings

☐

Programmings for individual film screen systems

☐

Jumper setting Basic Interface EZ150 :

BuckyDiagnost : Pos. W4-1

☐

DigitalDiagnost : Pos. W4-1

☐

Software programming AMPLIMAT sensitivity

BuckyDiagnost : high

☐

DigitalDiagnost : high

☐

factory
sidefield
side**Collimator + BuckyDiagnost CS 2/4, FS****Type of collimator**Manual ☐Automatic ☐**For your information:**

Manual + Automatic

Power supply for coll. bulb = V (11...12 V) (measured on bulb)

**Coincidence of X-ray field and light field**

Exposure data: SID = 100 cm
 small focus
 kV
 mAs

Test images for sensing ☐light – X-ray ☐

Enclosed this report.

The tolerances in the table are valid for an SID = 100cm.

The tolerances change linearly depending on the SID.

The maximum deviation between light and X-ray is allowed to be as follows at all four edges. (see table)

	automatic	manual
Tol.	+5 / -3 mm	+9 / -3 mm

The maximum deviation at the top/bottom edge and left/right edge is 5 mm.

In case the light field is smaller than the X-ray field, use minus signs.

measured deviations			
Top :	mm	Bottom :	mm
Left :	mm	Right :	mm
		Diff. :	mm
		Diff. :	mm

factory
sidefield
side**BuckyDiagnost CS 2/4, FS**All mechanical movements are in order to the internal checklist (factory side). ☐All functions are in order to the operator manual. ☐Lamp functions – breaks – catches – end stops – cabling. ☐The detents must be programmed with X-Scope ☐**BuckyDiagnost CS 2/4:****The sensing function is tested**in longitudinal direction ☐ transversal direction ☐**BuckyDiagnost FS:****The sensing function is tested** ☐**Tracking****BuckyDiagnost VE / VT / VR / VE2 / VT2**Function of remote control (light, collimator) during system READY ☐Pick-up band (def. 300 mm) ☐End-position potentiometer ☐**BuckyDiagnost CS 2/4**Current limit during tracking ☐Pick-up band (def. 300 mm) ☐**TraumaDiagnost**

(not implemented)

Order No.:

Customer: Room:

	Technician/Name	Signature	Date
Factory			
Service			

factory side	field side
-----------------	---------------

2. Programming and adjustment

The mechanical installation must be done in order of the installation manual.

For adjusting and programming fill out the attached list.

BuckyDiagnost TH2 / TF and DigitalDiagnost TH

Function in order to the operator manual

☐
☐

Programming in X-Scope customer name, room No. and basic settings must be checked and completed

☐

Table height –	standard: Table height measured on		
min. = mm (450 ± 5 mm)	cassette surface to ground	<input type="checkbox"/>	<input type="checkbox"/>
max. = mm (850 ± 5 mm)	digital : Sensitive layer of the flat detector to ground	<input type="checkbox"/>	<input type="checkbox"/>

BuckyDiagnost CS height

(This value is depending on your room height and therefore also adjusted on field side).

min. = mm

☐

max. = mm

From both values the SID is calculated.

For testing this value the real value may differ max ± 2 cm.

Displayed SID = cm "Real" SID = cm

☐
☐

If the deviation is too large the table height and CS height adjustment must be repeated.

Note

Motor current for table up (under max. load) $C = c1 20\mu F + c2 16\mu F$

(50 Hz / 230 V) $I = A (< 3.5 A)$

without $c2$ $I = A (< 2.5 A)$

Nominal value = 120 ms ± 4 ms

☐

No grid lines visible by exposure time $t \geq 3$ msec.

factory
sidefield
side**Tomo + TH and Tomo 2 + TH2**

Function in order to the operator manual

☐☐

Servo assistance during tomo run o.k.

☐☐

Image quality Tomogram:

Angle	Tomo time in s	Layer height in mm	Layer height deviation \pm 3mm
40°	1.2	45	
40°	1.2	130	
40°	1.2	199	

Image resolution in images enclosed this test report.

With standard test grid (50 μ funk raster)

limiting resolution = 2.32lp/mm with small focus

(spotcheck)

☐

actual resolution = lp/mm

☐

Layer height

Measured deviation by 130 mm layer height (max. deviation is \pm 3 mm)

(spotcheck)

☐

nominal layer height = mm

actual layer height = mm

☐**Note***The layer height is adjustable with "tid" under X-Scope. tid = mm**tid nominal = 65 mm**Range of adjustment = 65 ... 75 mm**tid ACL nominal = 70 mm**Range of adjustment = 70 ... 80 mm**tid flat detector = 78 mm**Range of adjustment = 70 ... 90 mm*☐

factory
sidefield
side**Extent of the X-ray beam**

(spotcheck)

☐☐

The extent of the X-ray beam with Tomo is tested by

layer height = 130 mm SID = 115 cm Tomo angle = 40° 1,2 sec = Exposure time

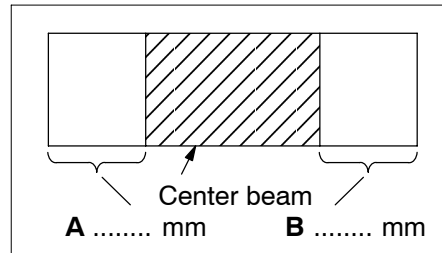
$$|A| - |B| = \leq 6 \text{ mm}$$

A = mm

B = mm

Maximum extent of the X-ray beam

$$|A| + |B| = \leq 40 \text{ mm}$$

**Symmetry**

(spotcheck)

☐☐

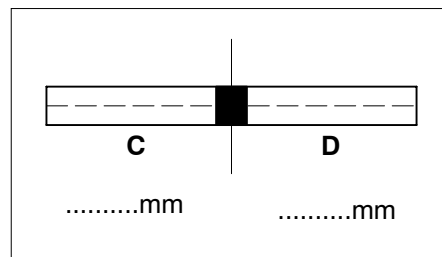
The symmetry of the X-ray beam with Tomo is tested by

layer height = 130 mm SID = 115 cm Tomo angle = 40° 1,2 sec = Exposure time

$$|C| - |D| = \leq 5 \text{ mm}$$

C = mm

D = mm



Order No.:

Customer: Room:

	Technician/Name	Signature	Date
Factory			
Service			

factory
sidefield
side

1. Programming and adjustment

The mechanical installation must be done in order of the installation manual.

For adjusting and programming fill out the attached list.

BuckyDiagnost VE / VT / VR / VE2 / VT2

AMPLIMAT function

☐

All mechanical movements and functions are in order to the operator manual.

☐

Nominal value = 120 ms \pm 4ms

☐

No grid lines visible by exposure time $t \geq 3$ msec.

Order No.:

Customer: Room:

	Technician/Name	Signature	Date
Factory			
Service			

factory side	field side
--------------	------------

3. General / Safety aspects**System configuration:**Generator OPTIMUS 50 ☐ 65 ☐ 80 ☐

Room 1

Room 2

Room 3

Emergency switch off is checked

Fault current switch tested

Connected earth cable and check the bucky/digital DIAGNOST TH, bucky wall stand (BWS), CS.. and measure the earth resistance test ☐The earth resistance (as measured above) must always be < 100 mΩ
(central point = generator)

All end stops are installed, specially on the CS rails

Functional test of collisions switches

Unit	Down	Up	Remarks
TH table	≤ 200 N		completely assembled including table top and covers
CS	≤ 100 N		weight compensation performed
Motor VE / VT	70 N ± 10 N	70 N ± 10 N	completely assembled and weight compensation performed

Note*Do not adjust the TH table collision switch SSI10 (factory calibrated).*

CS covers are fixed

Exception test according RÖV / VA / DOD or other national regulations

Order No.:

Customer: Room:

	Technician/Name	Signature	Date
Factory			
Service			

LIST OF PAGES AND MODULES

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Collimator Compliance Test

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1. Introduction

NOTE

This test must be done after assembly and after each collimator or X-ray source exchange, to be in compliance with IEC 60601–1–3 and 21CFR 1020. This test is mandatory for the USA and Canada. If measurements show values outside of acceptable tolerances (see Workbook 5), check the mechanical adjustments and repeat measurements. If the stated tolerances are exceeded, then the system is not in compliance with IEC 60601–1–3 and FDA regulations and must not be operated.

Test Equipment / Tools

Cassette (18x 24 cm)
Cassette (24 x 30 cm)
Cassette (35 x 43 cm)
Cassette (35 x 35 cm)
Ruler, metric / inch
Metal washer
10 foot measuring tape
4 copper strips

2. Test 1: Alignment of BLD Light Field and X-Ray Field (Radiographic)

NOTE

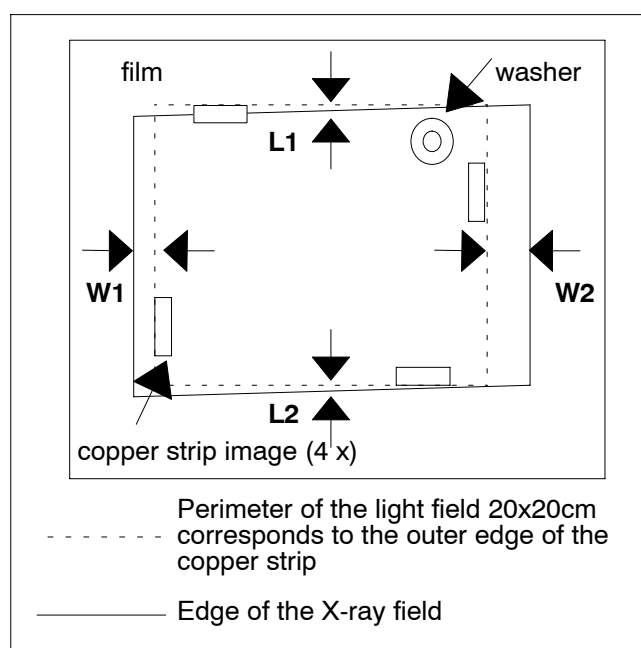
This test is to determine that the X-ray field size and location is identical to the BLD light field for large and small focus!

Setup

1. Place the loaded 10 x 12" (24 x 30 cm) cassette on the table top and center the overtable tube directly at a SID of 40" (100 cm).
2. Place empty 8 x 10" (18 x 24 cm) cassette in the bucky unit to enable exposure.

Test

1. Turn on the BLD light.
2. Define the light field perimeter by placing outer edges of copper strips at the four light field sides (refer to figure).
3. Place washer in one quadrant of the film at the anode end to identify positioning after development.
4. Select large focus and overtable tube at control desk and expose at 60 kV, 5 mAs.
5. Develop the film.
6. Measure the distances L1, L2, W1 and W2 between outside edges of copper strips and the edges of the X-ray field as shown.
7. Repeat the test for small focus.



Result

Record all measurements and file in the workbook. The measurements must comply with the rejection limits. Number and date the films and file them with the workbook.

Specification

The total misalignment of the edges of the BLD light field with the respective edges of the X-ray field along either the width or length of the light field shall not exceed 2 % of the SID.

SID = 40" (100 cm); 2.0 % x 40" (100 cm) = 0.80" (2 cm)	
Large focus	$L1 + L2 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \leq 2.0 \% \text{ SID}$ $W1 + W2 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \leq 2.0 \% \text{ SID}$
Small focus	$L1 + L2 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \leq 2.0 \% \text{ SID}$ $W1 + W2 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \leq 2.0 \% \text{ SID}$

Initials	Date

3. Test 2: X-Ray Field Center Alignment (Overtable Tube)

NOTE

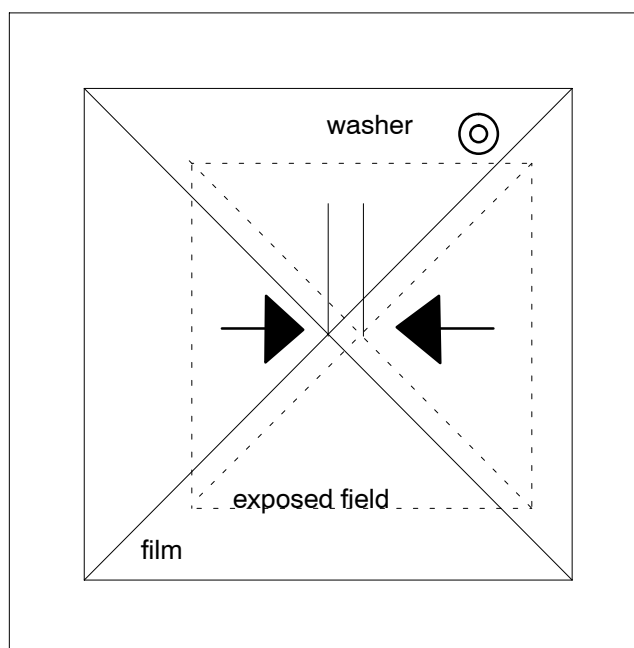
This test must be performed for all tables / bucky stations as well as bucky wallstands, cassette stands etc.!

Setup

Equipment completely assembled.

Test

1. Select the tube and image receptor station on the control desk.
2. Center the tube to the image receptor by using the available centering aids (the centering stops on the ceiling rails, the centering light in the tube control handle bar etc.). Set tube at max. SID: 40" (100 cm) for bucky table, up to 72" (180 cm) for bucky wallstand.
3. Tape the metal washer in one quadrant of the cassette at the anode end for film orientation.
4. Place the loaded cassette (10 x 12 ") or (24 x 30 cm) in the bucky tray and ensure that it is properly centered before the tray is inserted into the bucky unit.
5. Manually set the BLD to a slightly smaller size (approx. 9 x 11") than the cassette size so that the radiated area will be within the limits of the X-ray film.
6. Make an exposure at 60 kV, 5 mAs.
7. Develop the film.
8. On the developed film, locate two points on each of the four sides of the exposed field as it is shown in the figure below.
9. Draw straight lines through two points on each side. Extend the lines until they intersect. The resulting rectangle will be a close approximation of the X-ray field.
10. Draw diagonals across this field. The crossing point of the diagonals is the X-ray field center. Also draw diagonals across the X-ray film. The crossing point is the X-ray film center.
11. Measure the distance between both centers. This is the displacement (misalignment) of the X-ray field in relation to the image receptor.



Results

Record the displacement and file in the workbook. Write the test number and date on the film and file it with the workbook. The test result must be within the rejection limit.

Specification

The displacement between the X-ray film center and the X-ray field center must be $\leq 2.0\%$ SID.

SID = 100 cm; maximum displacement = 20 mm

SID = 180 cm; maximum displacement = 36 mm.

NOTE

This test must be performed for all tables / bucky stations as well as bucky wallstands, cassette stands etc.! If a tube can be used at two different SIDs with the same image receptor, test for both SIDs (tracking).

Measured displacement (mm)	
Maximum displacement for SID = 100 cm = 20 mm	
Maximum displacement for SID = 180 cm = 36 mm	
bucky table	bucky wallstand
_____ mm	_____ mm
_____ mm	_____ mm

Initials	Date

4. Test 3: X-Ray Field Limitation and PBL Operating Range

NOTE

This test must be performed for all overtable tube / bucky stations as well as bucky wallstands, cassette stands etc.! Stands that are used at two different SIDs must be tested at both distances.

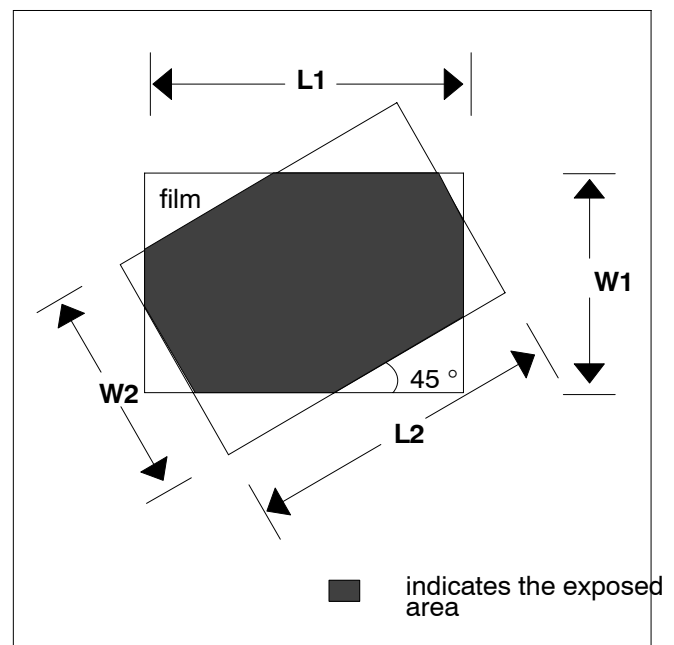
Setup

Equipment completely assembled.

Test

TABLE BUCKY (Field Limitation Test / Indicated Field Test)

1. Select table bucky auxiliary at the generator control desk.
2. Set SID to 100 cm. Center the X-ray tube over table bucky.
3. Rotate the collimator to 45 °.
4. Insert the loaded 18 x 24 cm cassette in the bucky tray.
5. Record the indicated field size from collimator dials below.
Length = _____ Width = _____
6. Make an exposure at 60 kV, 5 mAs.
7. Remove the cassette and put it to a radiation safe place.
8. Repeat steps 4 and 6 using a loaded 35 x 43 cm cassette.
9. Develop both films.
10. Referring to the figure, measure the actual length and width of both films (L1 and W1). Measure the length and width of the exposed area of both films (L2 and W2).



Results

Record all measurements and file in the workbook. Verify that the results are within the specifications. Write the test number and date on the film and file it with the workbook.

Test

BUCKY WALLSTAND (Field Limitation Test)

1. Select bucky wallstand at the generator control desk.
2. Center the X-ray tube to the bucky wallstand and set the SID to 180 cm (72").
3. Rotate the collimator to 45 °.
4. Insert the loaded 18 x 24 cm cassette in the bucky tray.
5. Make an exposure at 60 kV, 5 mAs.
6. Remove the cassette and put it to a radiation safe place.
7. Repeat steps 4 and 6 using a loaded 35 x 43 cm cassette.
8. Develop both films.
9. Referring to the figure on the next page, measure the actual length and width of both films (L1 and W1). Measure the length and width of the exposed area of both films (L2 and W2).

Results

Record all measurements and file in the workbook. Verify that the results are within the specifications. Write the test number and date on the film and file it with the workbook.

Specifications

1. The total misalignment of the edges of the X-ray field with the respective edges of the selected portion of the image receptor along the length or width dimensions of the X-ray field in the plane of the image receptor shall not exceed 3 % of the SID.
2. The sum, without regard to the sign, of the above length and width misalignments shall not exceed 4 % of the SID.
3. The indicated field size and actual field size must be within 2 % of the maximum SID.
4. For BLDs with PBL and manufactured after November 30, 1983:
Positive Beam Limiting must be operational when:
 - a X-ray beam is within ± 3 % of vertical and
. SID is 90 cm to 130 cm, inclusive.
 - b X-ray beam is within ± 3 % of horizontal and
. SID is 90 cm to 205 cm, inclusive.

NOTE

This test must be performed for all overtable tube / bucky stations as well as bucky wallstands, cassette stands etc.! Stands that are used at two different SIDs must be tested at both distances.

BUCKY TABLE:

Indicated Field Size (Value read off of the collimator)		
	18 x 24 cm cassette	35 x 43 cm cassette
Indicated Width		
Indicated Length		

18 x 24 cm cassette bucky table			
Film (Actual Length and Width)	Exposed	Difference	Specification 100 cm SID
L1 = _____ cm	L2 = _____ cm	L1 – L2 = _____ cm	≤ 3 cm
W1 = _____ cm	W2 = _____ cm	W1 – W2 = _____ cm	≤ 3 cm
		Total difference = (sum of above) _____ cm	≤ 4 cm

Indicated	Exposed	Difference	Specification 100 cm SID
(L step 5) _____ cm	(L2 above) _____ cm	(Ind – Exp) _____ cm	≤ 2 cm
(W step 5) _____ cm	(W2 above) _____ cm	(Ind – Exp) _____ cm	≤ 2 cm

BUCKY TABLE (continued):

35 x 43 cm cassette bucky table			
Film (Actual Length and Width)	Exposed	Difference	Specification 100 cm SID
L1 = _____ cm	L2 = _____ cm	L1 – L2 = _____ cm	≤ 3 cm
W1 = _____ cm	W2 = _____ cm	W1 – W2 = _____ cm	≤ 3 cm
		Total difference = (sum of above) _____ cm	≤ 4 cm

Indicated	Exposed	Difference	Specificalton 100 cm SID
(L step 5) _____ cm	(L2 above) _____ cm	(Ind – Exp) _____ cm	≤ 2 cm
(W step 5) _____ cm	(W2 above) _____ cm	(Ind – Exp) _____ cm	≤ 2 cm

Initials	Date

Verify with a check (X) (not for manual collimator)	
X-ray beam direktion within 3 % of vertical	
PBL operational from 90...130 cm SID	

Initials	Date

BUCKY WALLSTAND (BWS):

18 x 35 cm cassette bucky wallstand			
Film (Actual Length and Width)	Exposed	Difference	Specification 100 cm SID
L1 = _____ cm	L2 = _____ cm	L1 – L2 = _____ cm	≤ 5.4cm
W1 = _____ cm	W2 = _____ cm	W1 – W2 = _____ cm	≤ 5.4 cm
		Total difference = (sum of above) _____ cm	≤ 7.2 cm

35 x 43 cm cassette bucky wallstand			
Film (Actual Length and Width)	Exposed	Difference	Specification 100 cm SID
L1 = _____ cm	L2 = _____ cm	L1 – L2 = _____ cm	≤ 5.4cm
W1 = _____ cm	W2 = _____ cm	W1 – W2 = _____ cm	≤ 5.4 cm
		Total difference = (sum of above) _____ cm	≤ 7.2 cm

Initials	Date

Verify with a check (X) (not for manual collimator)	
X-ray beam direction within 3 % of vertical	
PBL operational from 90...205 cm SID	

Initials	Date

5. Workbook Collimator

General

Customer:

Customers address:

Equipment address:

Distributor:

Installation date:

Report date:

Name of service engineer:

Signature of the service engineer:

Equipment

Component	Description	Type Number	Serial Number
Collimator	<input type="checkbox"/> GALILEO	9896 010 0061 _	
	<input type="checkbox"/> NICOL	9896 010 2200 _	
	<input type="checkbox"/> Manual Collimator	9890 010 804 _ _	
Bucky table			
Bucky wallstand			



Section 6

Service information

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- | | | |
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| 1.2. | Data sheet | Bucky WS VE |
| 1.3. | Grid data sheet | Bucky module |
| 1.4. | Grid data sheet | Bucky WS VE |
| 1.5. | CE certificate | X-ray tube |

2. Service software

- 2.1. Electronic Spare Part Finder (e-SPF) CD
- 2.2. Service documentation CD

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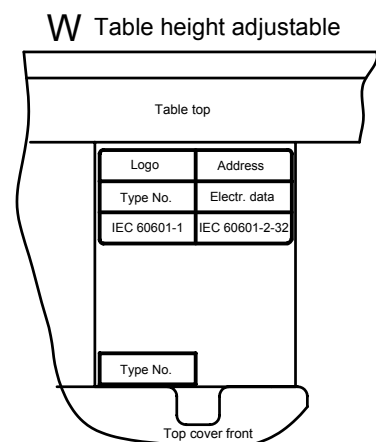
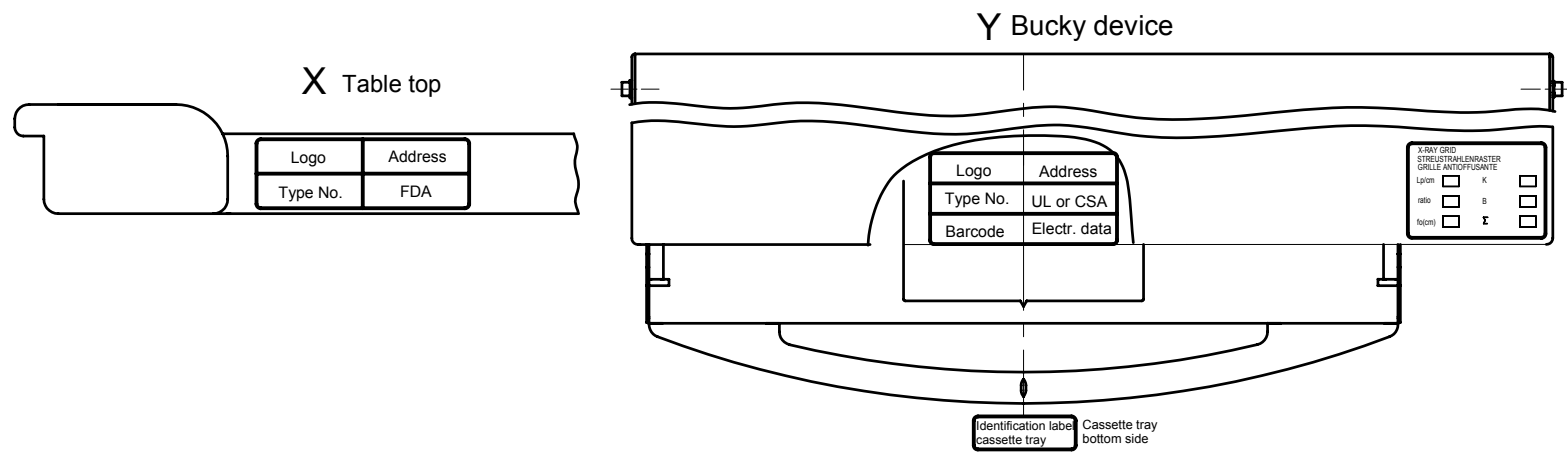
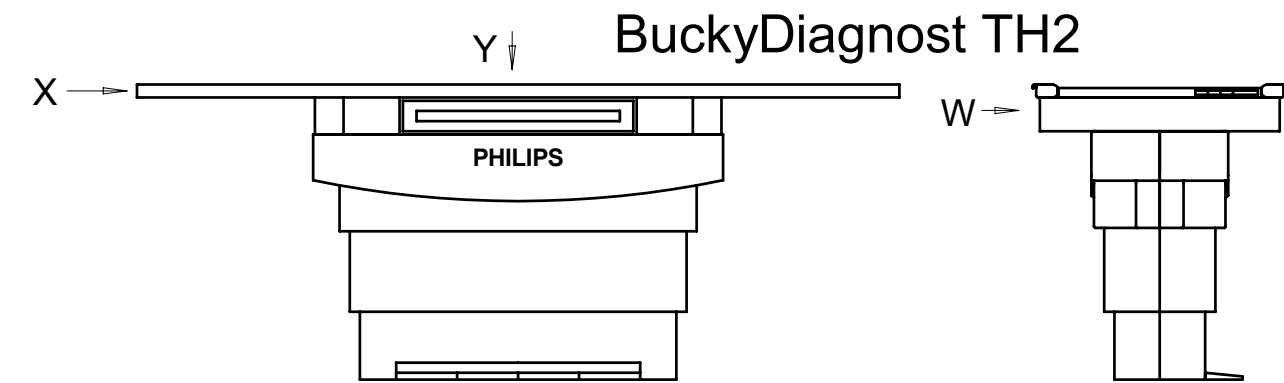
- 3.1. Backup bucky controller
- 3.2. Backup generator

4. Labeling BuckyDiagnost IsoRAD

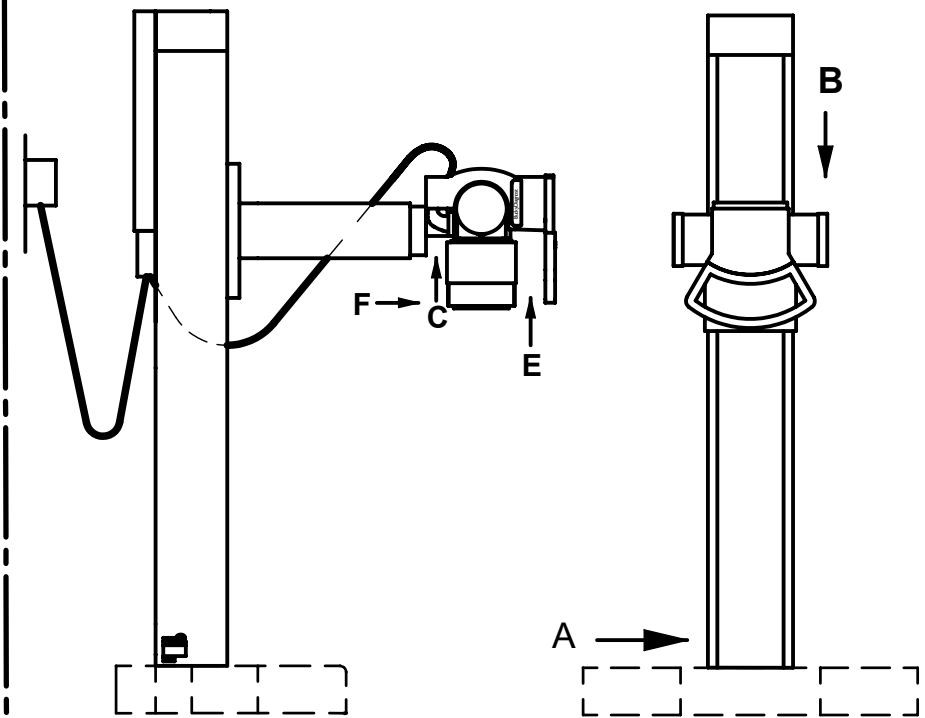
5. FCO's

6.





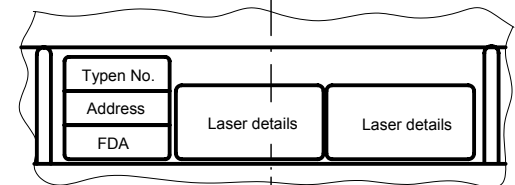
BuckyDiagnost FS ISO RAD



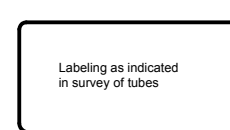
A System labels

Logo	Address
Typen No.	Electr. data
IEC 60601-1	IEC 60601-2-32

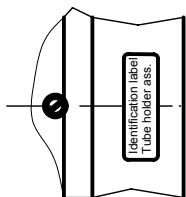
E Control grip



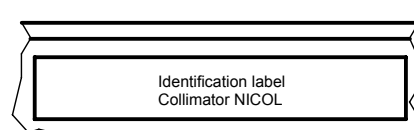
B



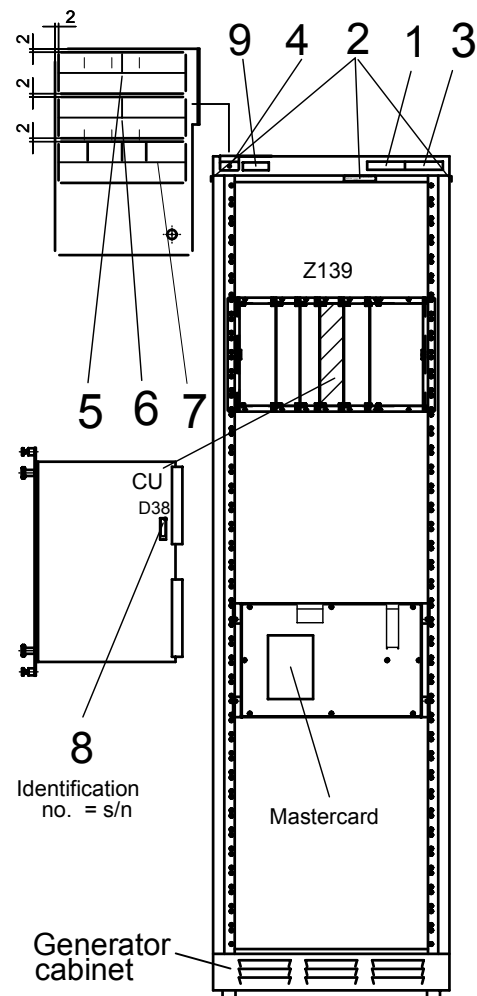
C Tube holder assy



F Collimator



Optimus RAD US



1 **OPTIMUS 50**

2 **CAUTION** HAZARD FOR LIVE AND /OR MOVING PARTS. ATTENTION WHEN SERVICING ENERGIZED EQUIPMENT. OBSERVE THE SERVICE-MANUAL.

3 **PHILIPS** MADE IN GERMANY

4 **i** Certified Component Labels Here

5 **X-RAY CONTROL** - type 9890 000 0200x s/n xx xxxxx OPTIMUS 50/65/80 Philips Medical Systems DMC GmbH Röntgenstr. 24 D-22335 Hamburg / Germany

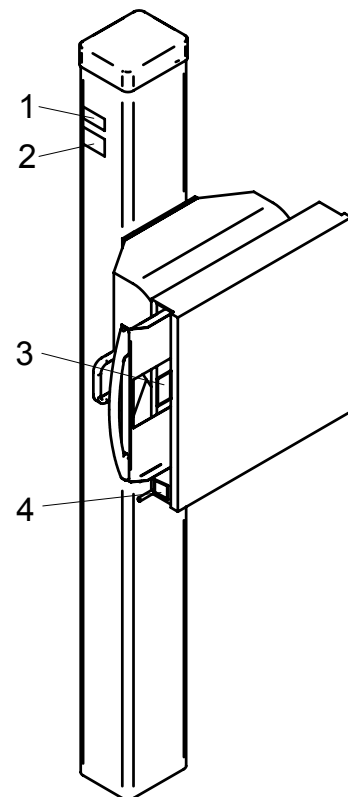
6 **X-RAY HV GENERATOR** - type 9890 000 xxxxx s/n xx xxxxx OPTIMUS Philips Medical Systems DMC GmbH Röntgenstr. 24 D-22335 Hamburg / Germany

7 **50 kW** 3~50/60Hz 400V 480V 145A 120A

8 **SN.**

Logo	Address
Type number	Date info
IEC 60601-1	IEC 60601-2-32

BuckyDiagnost VE



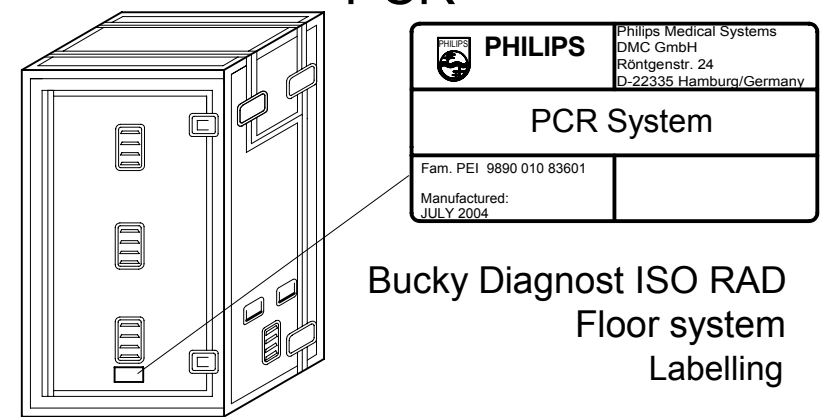
1 type 4512 201 0200. s/n buckyDIAGNOST VE kurz DHHS requirements Made by HANS PAUSCH **CE**

2 **PHILIPS** Philips Medical Systems DMC GmbH Röntgenstr. 24 D-22335 Hamburg/Germany type 9890 010 0651. s/n yy.00.nnn bucky DIAGNOST VE / VT Class I - Type B IEC 60601-1 Associated equipment IEC 60601-2-32:1994

3 **PHILIPS** Philips Medical Systems DMC GmbH Röntgenstr. 24 D-22335 Hamburg/Germany type 4512 201 0223. s/n yy.00.nnn bucky device sensing right **C** **US** 24V --- 350mA

4 **X-RAY GRID** STREUSTRAHLENRASTER GRILLE ANTIOFFUSANTE Lp(cm) ☐ K ☐ ratio ☐ B ☐ fo(cm) ☐ Σ ☐

PCR



Bucky Diagnost ISO RAD Floor system Labelling

PHILIPS	Philips Medical Systems DMC GmbH Röntgenstr. 24 D-22335 Hamburg/Germany
PCR System	
Fam. PEI 9890 010 83601	
Manufactured: JULY 2004	

4512 983 09161

CSIP Level 0 (06.0)

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Section 7

Software release bulletins

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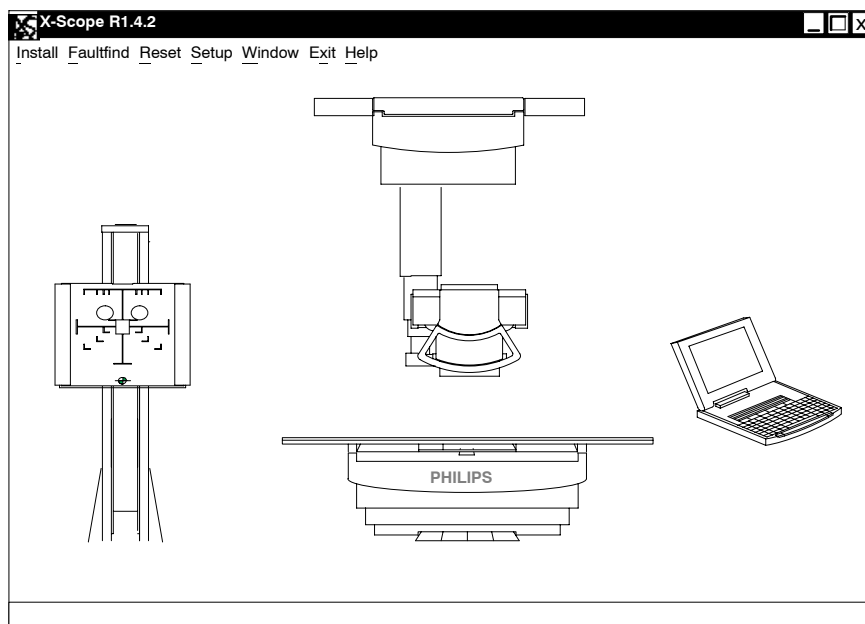
1. X-Scope bucky controller manual

2.



X-Scope bucky Controller

X-Scope Release 1.4.2 for BuckyDiagnost with bucky controller firmware Release 9.2



X-Scope software, configuration and adjustment for systems with bucky controller

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NO USE WITHOUT APPROPRIATE LICENCE**

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1. General

The window includes several bars:

1 Communication bar

All information about the program X-Scope to the connected Bucky controller are displayed here.

2 Instruction bar

This bar shows help messages.

3 Status bar

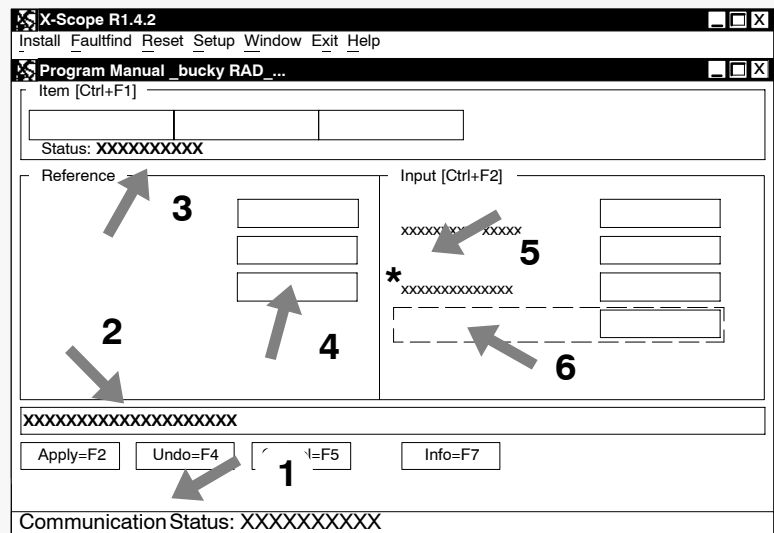
Internal information about operating conditions of X-Scope

4 Reference window

Shows active data

5 Faulty inputs are marked with “*”

6 The active input field is marked with a frame.



2. Program X-Scope

X-Scope is a computer-based windows program for various Philips radiography systems. This program supports system adjustments and allows the service engineer to assign various functions and parameters to the bucky system controller and the collimator.

All adjustments and data will be written into the bucky controller memory.

3. Compatibility

MS Windows ≥ 3.1

X-Scope R1.4.2

Bucky controller firmware R9.2

Functions of the program X-Scope

- Working with normal Windows conventions
- Installation of system parameter (programming)
- Adjustments of system devices
- Recording of errors, warnings and service data
- Button *Apply*=F2 to write data to Bucky controller
- Button *Repeat*=F4 to do the same stage again
- Button *Cancel*=F5 to determine the step
- Button *OK*=F3 to end the session
- Button *Undo*=F4 to undo the changes after clicking on button *Apply*=F2

4. Convention

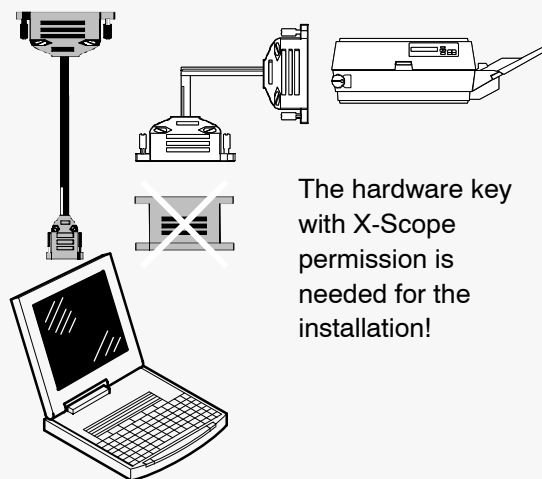
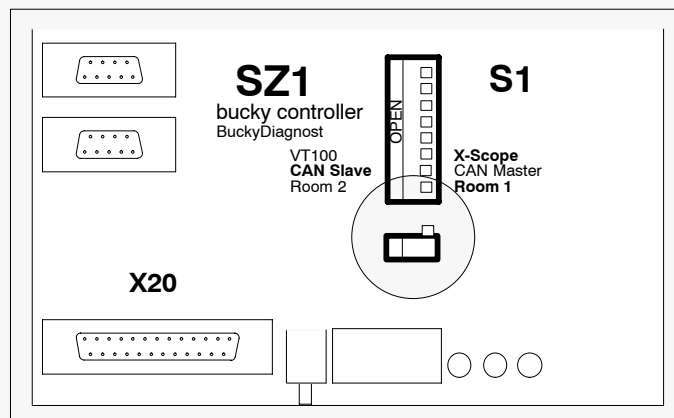
Terms in *italics* specify sequential steps to be performed.

TOOLS

1	Service PC with installed program MS Windows
≥ 3.1	
1 4512 130 56931	X-Scope service cable

5. Installation

- Switch OFF System and PC.
- Check **S1** on the Bucky controller board **SZ1**, refer to figure on the right.
- Connect a data line from serial port COM1 to the Bucky controller **SZ1 X20**.
- Switch *ON* the Bucky system and the PC.
- Start MS Windows.
- Install program X-Scope according to the instructions delivered.



6. Introduction

For setting up the system it is necessary to follow the instructions step by step as described in this manual. All devices must be selected correctly and entered in X-Scope. The parameters will be written into the Bucky controller memory.

Note down the adjustment values in the respective fields, so that configuration is easier in case of a replacement.

xxxxx
 xxxxx
 yyyyy
 zzzzz

☐ Field to mark the selected item
☐
☒

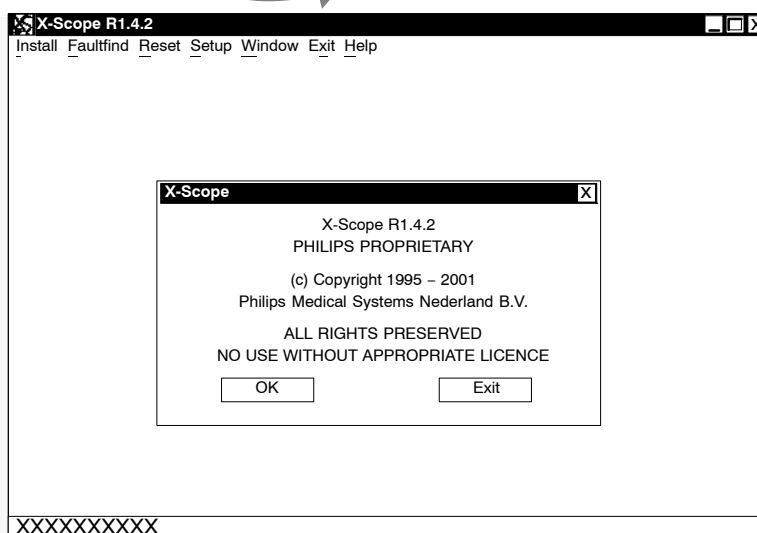
Field to write in measured value

7. X-Scope Start

- Start X-Scope

The X-Scope window appears. The communication status bar informs about data transfer, refer to screen bar xxxxxxxx

- Click *OK* or quit with *Exit*



If an error occurs, try another port or check the settings.

- Click *OK* or *Enter* to accept the message.
- Go on with
8. "Set-up of Communication Port".
- When the following window appears, the PC communication port is selected.
- Click *OK* or *Enter* to accept the message.
- Proceed with 9. "Programming".

8. Set-up of communication port

- Select *Set-up*.
- Select *Default Settings*.
- Change the communication port by pressing the ▼ button.
 - Highlight = *click on* the correct communication port.

NOTE

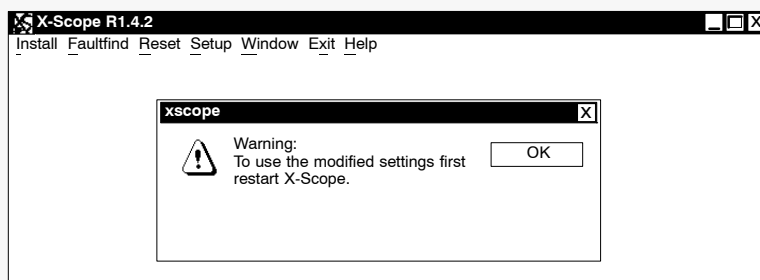
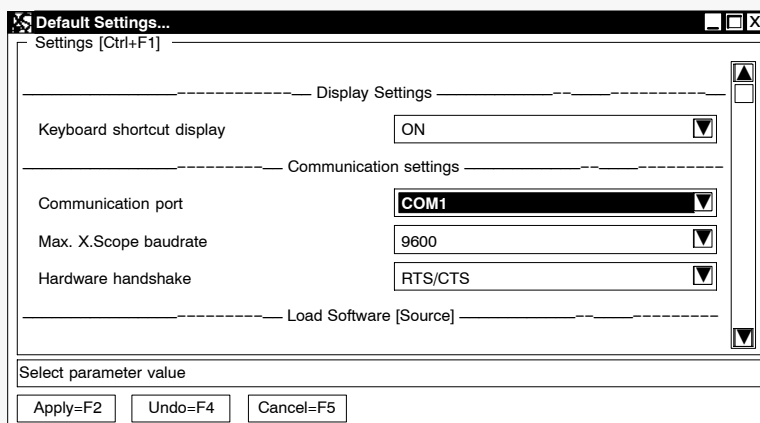
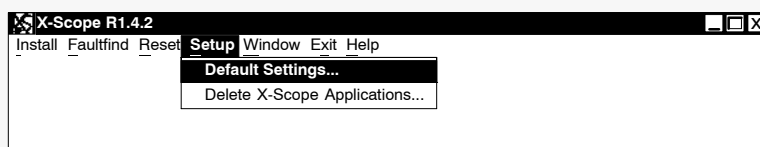
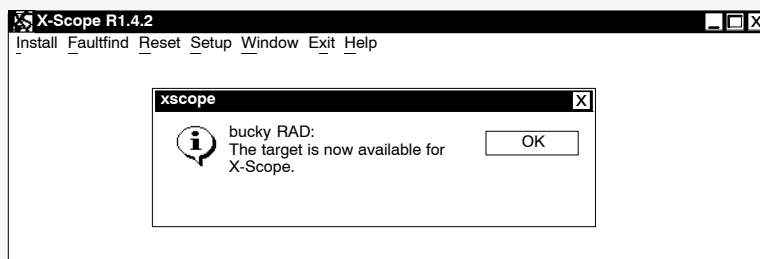
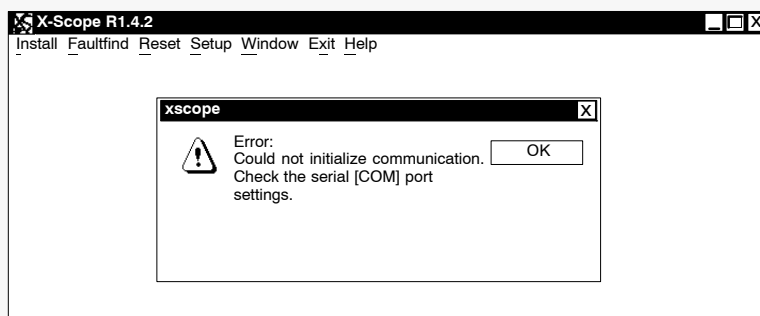
Use the other settings as shown in figure.

To store on *Click Apply=F2*

To recall *Click Undo=F4*

To cancel the sub-menu

- Click *Cancel=F5*
- Click *OK* or *Enter* to accept this message.
- Exit and restart X-Scope.



9. Programming

For the first time delete the X-Scope applications.

- Select *Setup*.
- Select *Delete X-Scope Applications*.
- Follow the instructions.

9.1. Manual programming

The sub-menus

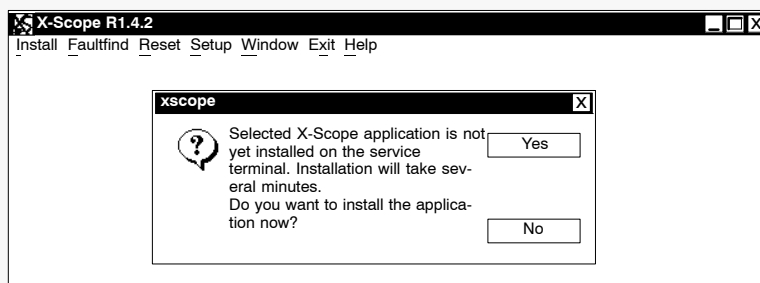
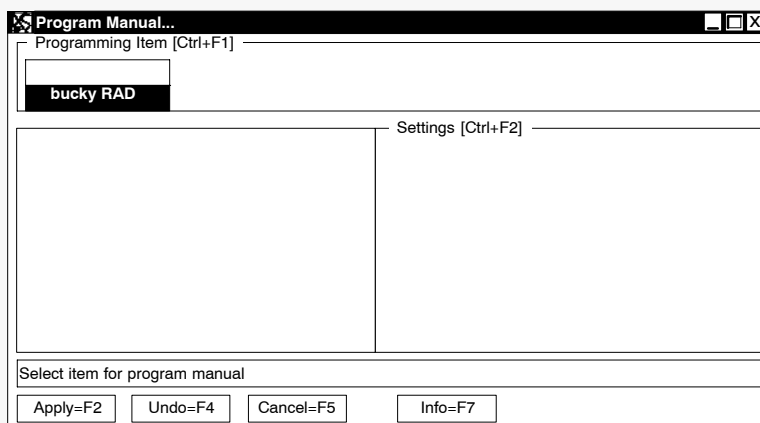
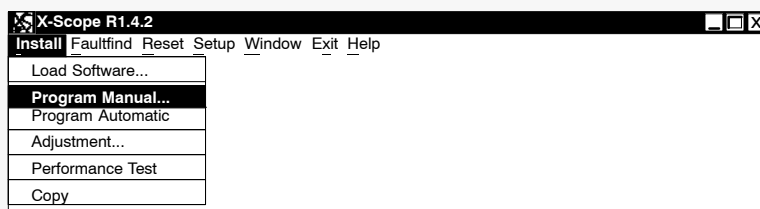
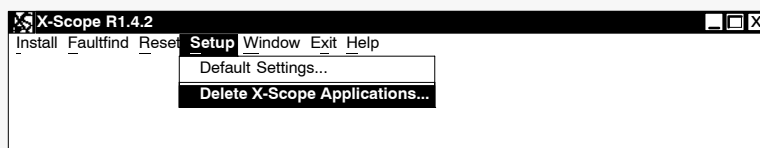
- *Load Software*
- *Program Automatic*
- *Performance Test*
- *Copy*

are not yet implemented.

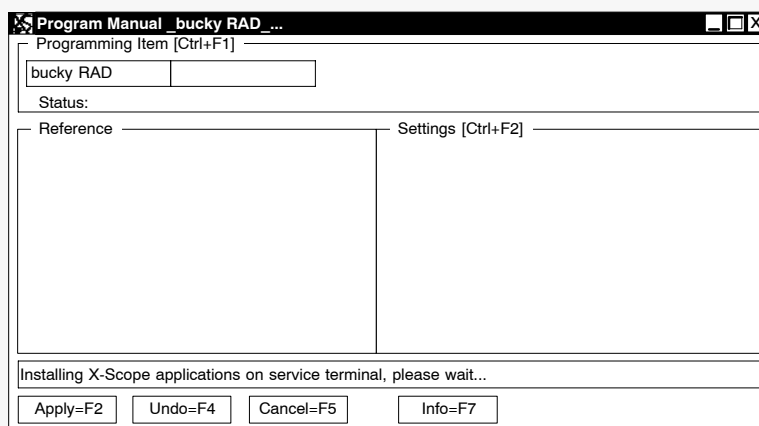
- Select *Install*
 - Select *Program Manual*.
 - Press *Enter* key.
- Select *bucky RAD* and press *Enter* key

If the window on the right appears the required application is not yet installed.

- Click on *Yes* to install the application. This will take about 5 minutes.



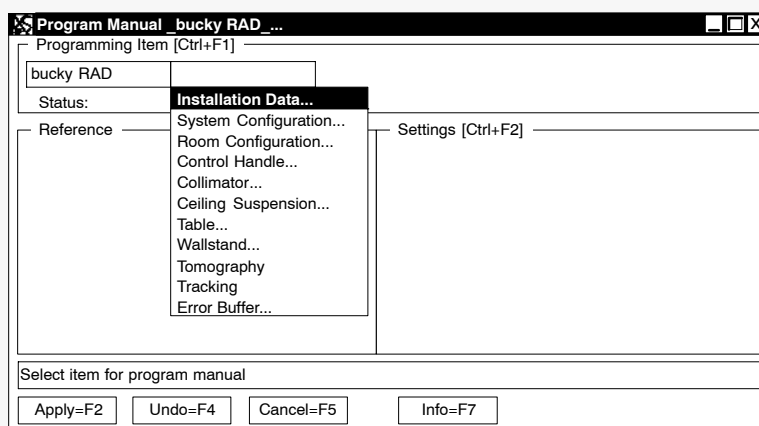
The window on the right indicates that the installation is still in progress.



X-Scope is ready now for programming.
The status menu appears.

If the applications are installed on the service PC an item can be configured.

- Select required item.



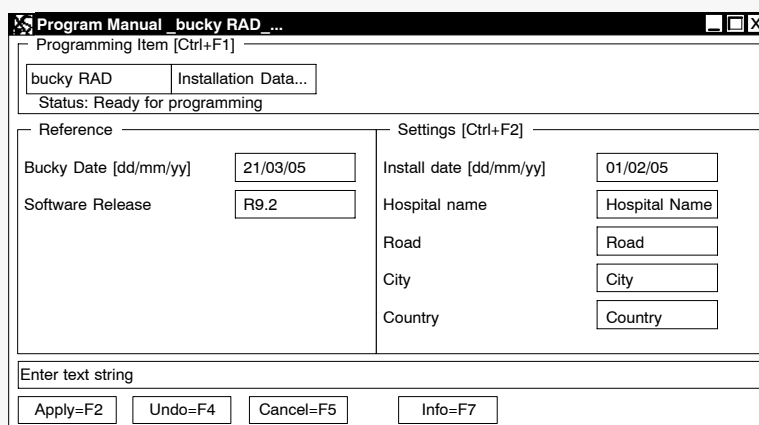
9.1.1. Installation data

This sub-menu contains items related to the current Bucky installation such as the hospital name and address or the date when the system was installed.

- Select *Installation Data* with *double-click*

The following window appears.

- Enter the required data in the fields.
- To store click on *Apply=F2*.
- Click on *Installation Data* to open the selected menu.



Software Release

R9.2

Figure shows the version of the inserted Bucky firmware.

9.1.2. System configuration

This sub-menu contains all parameters having global effect on the whole Bucky system, e.g. the language or the real time clock of the bucky controller.

- Select *System Configuration* with *double-click*.

The following window appears.

NOTE

The figures on the right show default values.

- Use the cursor to select the required item.
- For more selections use the ▼ or ▲ button.
 - Highlight the required setting.

In case that imperial is programmed,

check the programming on INALFA Bucky unit board VA2.

Jumper setting : S1.1 = OFF = inch=Imperial
S1.1 = ON = metric

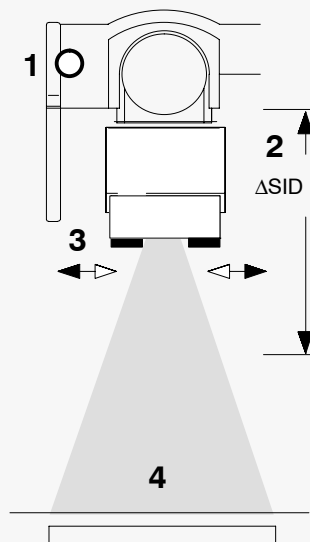
For selecting the collimation type refer to 9.1.5. “Collimator configuration”
After selecting *Galileo* or *Nicol* type in the value of *Amplimat Thresh.*

- To store click *Apply=F2*.

Click on *System Configuration* to open the selection menu.

PBL[+ve Beam Limiting]	YES <input checked="" type="checkbox"/>	<input type="checkbox"/>
	NO <input type="checkbox"/>	
	YES <input type="checkbox"/>	

YES = has to be selected in U.S.A.



- 1 vary the collimation field
- 2 vary the SID value more than 20 mm

Exposition of the PBL = YES

3 shutters will limit the collimation field 4 to the full cassette size

Exposition of the PBL = NO

3 shutters will limit the collimation field to the collimation field size as before

Workstation-Fail Fallback	NO <input type="checkbox"/>
---------------------------	-----------------------------

not available for BuckyDiagnost

9.1.3. Room configuration

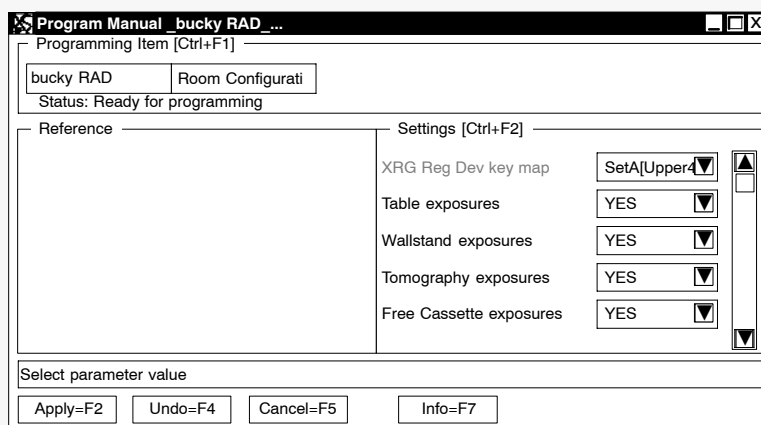
This programming item defines the existing devices.

A programming item set to NO is shown in brackets in the adjustment menu.

- Select *Room Configuration...* with *double-click*.

The following window appears.

- For more selections *click* the ▼ or ▲ button.
 - Select the required items.
- To store *click* on *Apply=F2*.
- Click on Room configuration to open the selection menu
- Set Tomography exposures to YES
- To store *click* on *Apply=F2*.
- Reset the Bucky controller.
- A message on the control handle will appear.
- Set Vertical Tracking Inst. to YES
- To store *click* on *Apply=F2*.
- Reset the Bucky controller.
- A message on the control handle will appear.



XRG Reg Dev key map	SetA[Upper4]▼	Not available for BuckyDiagnost
Table exposures	YES ▼ NO YES	To establish the table bucky <input type="checkbox"/> NO = bucky table is not installed <input type="checkbox"/> YES = bucky table is installed
Wallstand exposures	YES ▼ NO YES	To establish the wallstand bucky <input type="checkbox"/> NO = bucky wallstand is not installed <input type="checkbox"/> YES = bucky wallstand is installed
Tomography exposures	YES ▼ NO YES	To establish the tomo assembly <input type="checkbox"/> NO = tomo is not installed <input type="checkbox"/> YES = tomo is installed
Free Cassette exposures	YES ▼ NO YES	To select the free exposure function <input type="checkbox"/> NO = function is not available <input type="checkbox"/> YES = function is available
Vertical Tracking Inst.	NO ▼ NO YES	To select the vertical tracking function <input type="checkbox"/> NO = function is not available <input type="checkbox"/> YES = function is available

9.1.4. Control handle

This sub-menu contains only the parameters affecting the control handle.

- Select *Control Handle* with *double-click*.

The following window appears.

- For more selection *click on* the

▼ or ▲ button

- Highlight the installed device

- To overwrite setting data point in the setting field with a cursor *click*

- To store *click on Apply=F2*

- *Click on Control Handle* to open the selection menu.

Control Handle Type

Options[+disp]
Standard
Options[+disp]

- ☐ Standard = without display
☐ Options [+ disp] = with display

Filter Key Enable

YES
NO
YES

- ☐ NO
☐ YES = The filter key on the control handle is available

Key-Switch Enable

NO
NO
YES

- ☐ NO
☐ YES = key switch is present

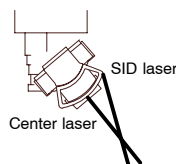
Man SID Beep [.1sec]

Value of beep duration.
 Only used for collimator Nicol = 0 ... 255

Slit light installed

Restricted
None
Restricted
Full function

- ☐ None = Center laser and SID laser are not available
☐ SID laser is available via
 RGDV free exposure,
 RGDV bucky table
 RGDV bucky wallstand
 SID laser is available via RGDV free exposure and RGDV bucky table, if the collimator is not in 0 ° or 90 ° position.
 Full function = SID laser is available at every time



Slit Light delay [sec]

 30

Value of slit light duration = 0 ... 255

NOTE

*If a control handle is installed without an SID laser the item **Full function** must be selected.*

9.1.5. Collimator configuration

This sub-menu contains all parameters affecting the collimator.

- Select *Collimator* with *double-click*.

The following window appears.

- Use the cursor to select the required items.
- Enter the new values.
- Click on the ▼ or ▲ button for more selections.
 - Highlight the installed device.
- To store click on *Apply=F2*.

To go to the next stage click on *Collimator...*

- Set Sim Light delay time.
- To store click on *Apply=F2*.
- Reset the bucky controller.

9.1.6. Ceiling suspension

This sub-menu contains all parameters that configure the ceiling suspension.

- Select *Ceiling Suspension* with *double-click*.

The following window appears.

- Use the cursor to select the required items.
- For more selections *click* the ▼ or ▲ button.
 - Highlight the installed device.
- To store *click* on *Apply=F2*.
- *Click* on *Ceiling Suspension* to open the selected menu.

NOTE

If long/trans position sensors are changed also 9.1.8 (Wallstand Position) has to be changed in programming.



WARNING

Make sure that only one catch position sensor (longitudinal or transverse) is programmed to "YES", otherwise system malfunction occurs:

"No tomo ready after leaving the system center position catch!"

Ceiling Suspension Type

CS2 [2m]
CS2 [2m]
CS4 [4m]
CE(economy)
Floor Stand

Long position sensors

YES
NO
YES

Trans position sensors

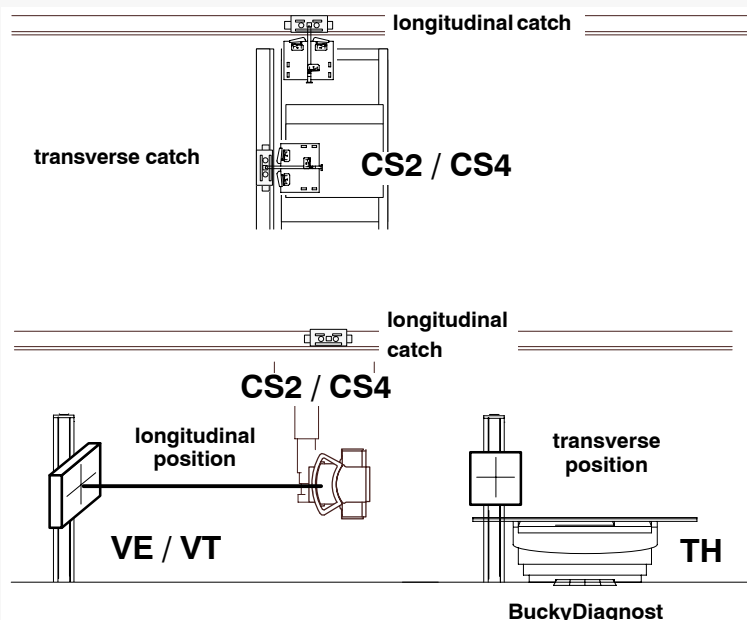
NO
NO
YES

☐ NO = used for BuckyDiagnost CS/FS without option sensing

☐ YES = used for BuckyDiagnost CS/FS with option sensing except systems with a transverse positioned wallstand (see Trans position sensors).

☐ NO = used for BuckyDiagnost CS and BuckyDiagnost FS Standard / Compact without option sensing. Must be set NO for BuckyDiagnost Fix.

☐ YES = used for BuckyDiagnost CS and BuckyDiagnost FS Standard / Compact with option sensing and transverse position wall stand.



9.1.7. Floor Stand

For the programming of the BuckyDiagnost FS (Floor Stand) refer to chapter 9.1.6 Ceiling suspension.

Different settings for the BuckyDiagnost FS are described in the ceiling suspension chapters.

9.1.8. Table configuration

This sub-menu contains all parameters affecting the table.

- Select *Table* with *double-click*.

The following window appears.

NOTE

Figures show default values.

- Use the cursor to select the required items.
- Click on the ▼ or ▲ button for more selections.
 - Highlight the installed devices.
- To store click on *Apply=F2*
- Click on *Table* to open the selection menu.

NOTE

TID = 69 mm for INALFA

TID = 70 mm for ACL4

The TID can be used if the actual tomo height will not meet the displayed tomo height as shown on control handle. In this case the TID value may be different from the “default” values.

Bucky Device Type	Manual [New] ▼	<input type="checkbox"/>	Type of cassette loader currently used.
	Manual [New]	<input type="checkbox"/>	New = type with encode disks
	Manual [Old]	<input type="checkbox"/>	Type of encoder disks
	Automatic	<input type="checkbox"/>	Automatic Cassette Loader (ACL)
	ACL4	<input type="checkbox"/>	Automatic Cassette Loader 4
	BUF Cassette	<input type="checkbox"/>	Bucky Unit Family Cassette

Cassette Sensing	YES ▼	<input type="checkbox"/>	NO = cassette sensing disabled
	NO	<input type="checkbox"/>	YES = cassette sensing enabled
	YES		

Receptor Offset [0.1mm]	0	Used to provide the possibility to narrow the collimator leaves by an offset factor so that they can always be seen on the film, default = 0 value in range 0....100
-------------------------	---	---

Height Sensing Installed	YES ▼	<input type="checkbox"/>	NO = EasyDiagnost or BuckyDiagnost TF (fixed table)
	NO	<input type="checkbox"/>	YES = BuckyDiagnost TH
	YES		
Fix Floor Film Hgt [mm]	755	used for EasyDiagnost	
	690	used for BuckyDiagnostTF (fixed table)	
		Table height sensing = No enables this function	

Table-Image Dist [mm]	Distance (TID) between the table surface and the film layer of the cassette
	<p>The values are defaults and can be adjusted (+/- 10 mm typ. range) in respect to using a patient mat (compressed) or the tomo layer height.</p> <p>— = film layer of the cassette</p>

9.1.9. Wallstand

This sub-menu contains all parameters that configure the wallstand.

Note

It is enabled only if:

Wallstand exposures = YES in the sub-menu *Room Configuration*.

- Select *Wallstand...* with *double-click*.

The following window appears:

Note

Figures show default values.

- Use the cursor to select the required items.
- Click on the ▼ or ▲ button for more selections.
 - Highlight the installed device.
- Use the cursor to select the required item.
- Click on the ▼ or ▲ button for more selections.
- Click on the ▼ or ▲ button for more selections.
- To store click on *Apply=F2*.

<p>Wall Stand Type</p> <div style="border: 1px solid black; padding: 2px;"> VE [economy] ▼ VE [economy] VT [tilt] VS (vert. motor) VS (both motors) VS (tilt motoriz) </div>	<div style="display: flex; align-items: center;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </div>	<p>Wallstand type attached to the system</p> <p>VE = standard</p> <p>VT = tiltable</p> <p>VS not tiltable</p> <p>VS tiltable</p> <p>VS tilt motorized</p>
<p>Bucky Device Type</p> <div style="border: 1px solid black; padding: 2px;"> ACL4 ▼ Manual [New] Manual [Old] Automatic ACL4 BUF Cassette </div>	<div style="display: flex; align-items: center;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </div>	<p>Type of cassette loader currently used</p> <p>New = type with encoder disks</p> <p>Old = type of encoder disks</p> <p>Automatic Cassette Loader (ACL)</p> <p>Automatic Cassette Loader 4</p> <p>Bucky Unit Family Cassette (only used in BuckyDagnost VS)</p>
<p>Bucky Device Orient</p> <div style="border: 1px solid black; padding: 2px;"> Left ▼ Left Right </div>	<p>Only applicable for BUF Cassette</p>	
<p>Cassette Sensing</p> <div style="border: 1px solid black; padding: 2px;"> YES ▼ NO YES </div>	<div style="display: flex; align-items: center;"> <input type="checkbox"/> <input type="checkbox"/> </div>	<p>NO</p> <p>YES = bucky tray has cassette format sensing, the item Receptor Offset is enabled</p>
<p>Receptor Offset [0.1mm]</p> <div style="border: 1px solid black; padding: 2px; width: 100px;"> 0 </div>	<p>Used to provide the possibility to narrow the collimator leaves by an offset factor so that they can always be seen on the exposure image, default = 0 value in range 0...100</p>	

- Click on *Wallstand* to open the selection menu.

NOTE

If *Wallstand Position* is changed also 9.1.6
Ceiling long/trans position sensor has to be
changed in programming..

Wallstand Position

Longitudinal	<input checked="" type="checkbox"/>
Transverse	<input type="checkbox"/>
Longitudinal	<input type="checkbox"/>

Transverse = bucky tray is placed to the **long** side of the bucky table
Longitudinal = bucky tray is placed to the **small** side of the bucky table

Wallstand on Rails ☐ Not applicable for BuckyDiagnost

Stitching Expo. SID 1 ☐ Not applicable for BuckyDiagnost

Stitching Expo. SID 2 ☐ Not applicable for BuckyDiagnost

Height Sensing Installed

YES	<input checked="" type="checkbox"/>
NO	<input type="checkbox"/>
YES	<input type="checkbox"/>

NO
YES = a continuous height needed for tracking option

Collimator Remote Ctrl.

NO	<input checked="" type="checkbox"/>
NO	<input type="checkbox"/>
YES	<input type="checkbox"/>

NO
YES = if a remote control is fitted in a BuckyDiagnost VS

WS Default Height [mm] Default height = 410 mm
 Not applicable for sensing

Note

*Menu is enabled only if:
Wallstand type = VS or VM
in the sub-menu Basic setup.*

TH-S installed ☐ YES = Single Sided Table is installed not applicable for BuckyDiagnost

MTP restricted ☐ YES = MTP is only possible in the wallstand position 'CS over hor. wallstand'

Tilt Def Speed [0.1°/s] Speed for bucky module tilting
range 50...200

Tilt MTP Speed [0.1°/s] Speed for move to position (MTP) of bucky module tilting
range 50...200

Vert. Low Speed [mm/s] Speed 1 (low) for bucky module up and down movement
range 20...60 Only applicable for BuckyDiagnost VS vertical motorized.

Vert. High Speed [mm/s] Speed 2 (high) for bucky module up and down movement
range 80...150 Only applicable for BuckyDiagnost VS vertical motorized.

Vert. MTP Speed [mm/s] Speed for move to position (MTP) of bucky module up and down movement
range 20...100 Only applicable for BuckyDiagnost VS vertical motorized.

Note

Figures show default values.

For allowed parameters refer to instruction bar.

- Use the cursor to select the required items.
- Click on the ▼ or ▲ button for more selections.
 - Highlight the installed device.
- To store click on *Apply=F2*.

Vert. Skull Pos [mm] range 1200...1750	1500	Vertical height of the bucky unit for MTP skull. Only applicable for BuckyDiagnost VS vertical motorized.
Vert. Thorax Pos [mm] range 1100...1600	1300	Vertical height of the bucky unit for MTP thorax. Only applicable for BuckyDiagnost VS vertical motorized.
Vert. Table Pos [mm] range 550...1000	550	Only applicable for BuckyDiagnost VS vertical motorized.
Vert. Lower Pos [mm] range 300...1000	500	Vertical height of the bucky unit for MTP knee or foot. Only applicable for BuckyDiagnost VS vertical motorized.
Vert. Upper Limit [mm] range 1500...1800	1800	Upper limit of the bucky module for motorized vertical movement. Only applicable for BuckyDiagnost VS vertical motorized.
Vert. Lower Limit [mm] 300...700	350	Lower limit of the bucky module for motorized vertical movement. Only applicable for BuckyDiagnost VS vertical motorized.
Under TB Pickup Bnd [mm]	300	Not applicable for BuckyDiagnost
Behind TB Pickup Bnd [mm]	300	Not applicable for BuckyDiagnost
Vert. Upper LowSpeed DS range 30...100	100	Distance to upper SW endswitch ("Vert. Upper Limit") from where the speed of the motorized movement will be limited.
Vert. Lower LowSpeed DS range 100...180	100	Distance to lower SW endswitch ("Vert. Lower Limit") from where the speed of the motorized movement will be limited.

9.1.10. Tomography configuration

In this sub-menu all data are related to the tomography option. This menu consists of two further sub-menus *Setup* and *Programs*.

NOTE

*It is enabled only if:
Tomography exposures = YES in the
sub-menu Room Configuration*

- Select *Tomography* with double-click.

The following window appears.

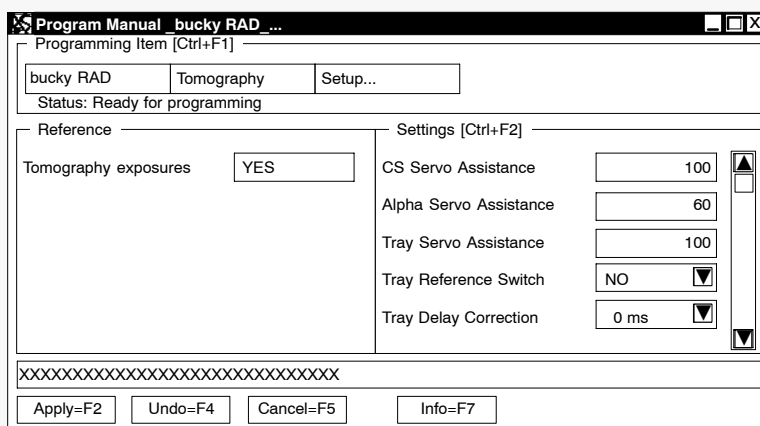
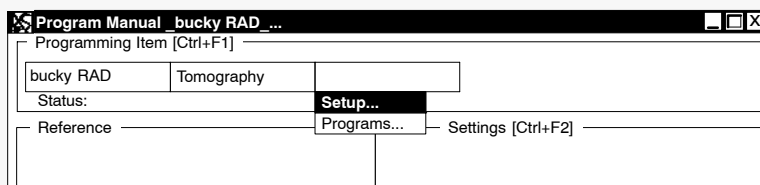
NOTE

Figures show default values.

- Select *Setup*.
 - Press *Enter* key.
- Use the cursor to select the required items.
- Click on the ▼ or ▲ button for more selections.
 - Highlight the installed device

BuckyDiagnost FS:

Setting	Recommended value
CS Servo Assistance	110
Alpha Servo Assistance	80
Tray Servo Assistance	100
Tray Delay Correction	-1 ms



CS Servo Assistance Value in range 3 ... 250

Alpha Servo Assistance Value in range 3 ... 250

Tray Servo Assistance Value in range 3 ... 250

Tray Reference Switch NO ▼
☒ NO ☐ YES
 NO = function is disabled (TOMO 2)
 YES = Tray Reference Switch is present (TOMO 1)

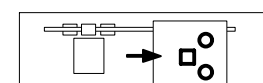
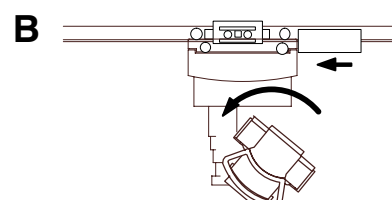
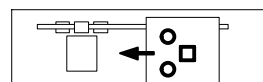
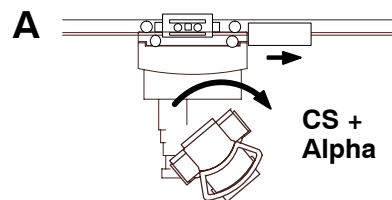
Note:

*Tomo 1 is manufactured 1995–1999
Tomo 2 is manufactured since spring 1999.*

Tray Delay Correction 2 ms ▼
 0 ms
 1 ms
 2 ms
 3 ms

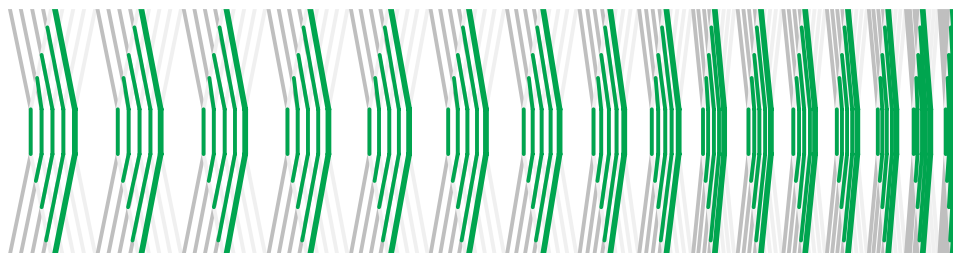
Value in range -15 ms ... +15 ms
Determine the value by qualification of the tomo image, use images quality tool.

- Check tray delay
 - Layer height: 90 mm (80 ... 100 mm)
 - Tomo program: 40° 1.2 s
- Position the tomo phantom in the bucky center
- Make an exposure, Tomo Run Direction **A**
- Check exposure
 - If figure 1 is shown decrease the value of Tray Delay Correction
 - If figure 2 is shown increase the value of Tray Delay Correction
- Make an exposure, Tomo Run Direction **B**
- Check exposure
 - If figure 2 is shown decrease the value of Tray Delay Correction
 - If figure 1 is shown increase the value of Tray Delay Correction

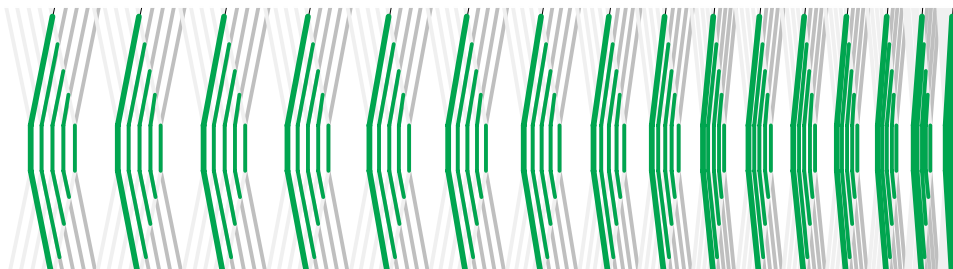


The ideal exposure shows the grid lines blurred symmetrically **3**.

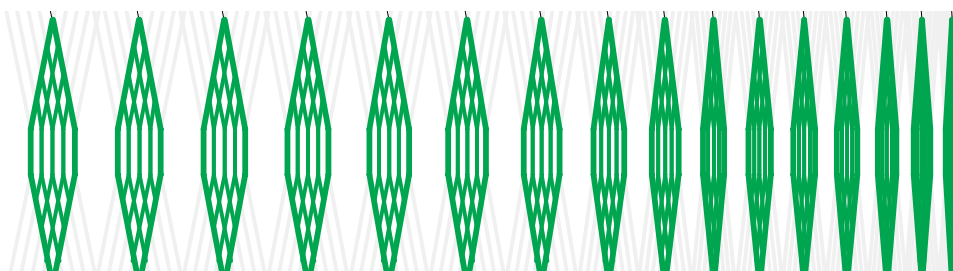
1



2



3



- To store click *Apply=F2*

NOTE

All stored settings are active after a system reset.

Switch the system OFF and restart.

Tray Tracking Enabled

NO	<input type="checkbox"/>
NO	<input checked="" type="checkbox"/>
YES	<input type="checkbox"/>

- ☐ NO = function is disabled.
- ☐ YES = only for automatic collimator auto bucky tray positioning for RGDV Table is enabled. When pressing the light switch on control handle the bucky tray moves centric under the tube automatically.

Normal Run Direction

All	<input type="checkbox"/>
All	<input checked="" type="checkbox"/>
Alpha+Table	<input type="checkbox"/>
CS+Table	<input type="checkbox"/>
Table	<input type="checkbox"/>
CS+Alpha	<input type="checkbox"/>
Alpha	<input type="checkbox"/>
CS	<input type="checkbox"/>
None	<input type="checkbox"/>

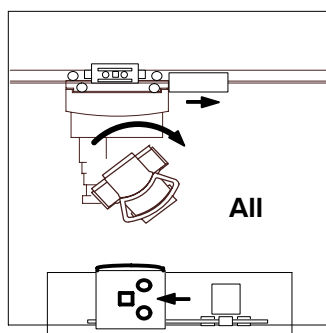
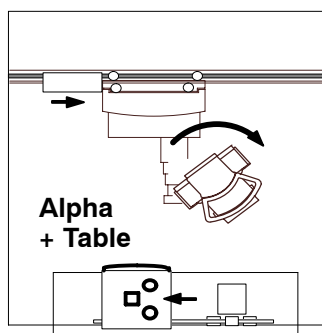
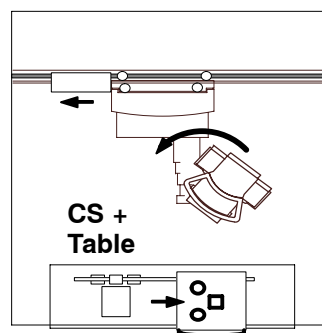
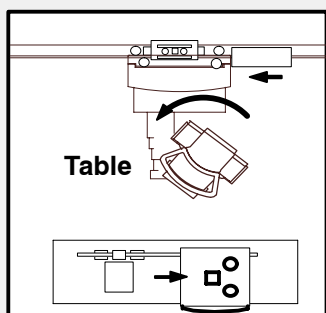
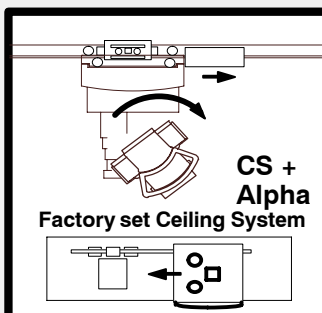
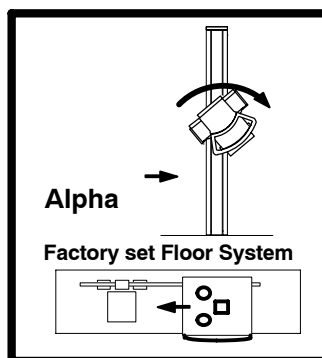
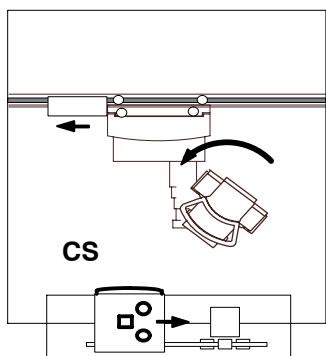
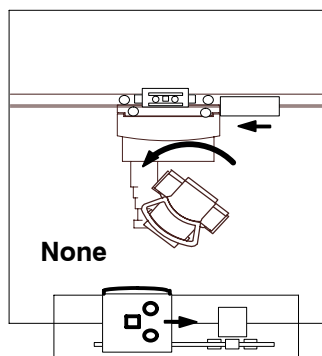
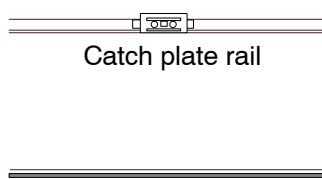
CS
→ **CS + Alpha** = factory set Tomo direction



Table

for BuckyDiagnost TH1

- ☐ **All** = Tomo runs left to right
- ☐ **None** = Tomo runs right to left
- for BuckyDiagnost TH2**
- ☐ **CS + Alpha** = Tomo runs left to right
- ☐ **Table** = Tomo runs right to left

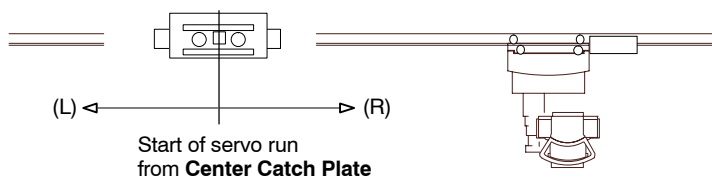
**All****Alpha + Table****CS + Table****Table****CS + Alpha**
Factory set Ceiling System**Alpha**
Factory set Floor System**CS****None**

Catch plate rail

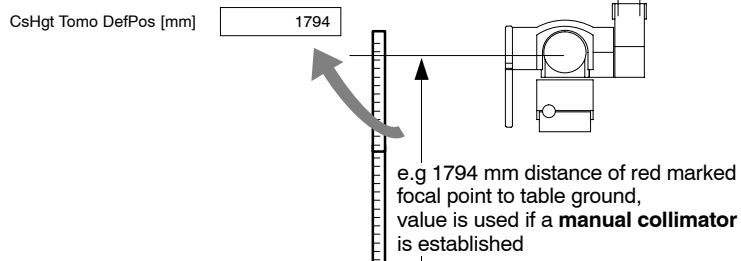
Brake rail

CS Servo (L) EndPos [cm] = value of servo run distance to left

CS Servo (R) EndPos [cm] = value of servo run distance to right

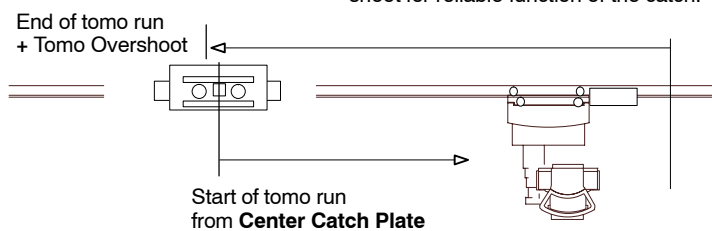


Enter parameter value in range 0 ... 600



Tomo Overshoot [mm] Default = 1 mm

After tomo exposure the CS/FS runs back to the catch plate and will stop after Tomo Overshoot for reliable function of the catch.



- Select *Programs*.
 - Press *Enter* key.

Four standard tomography programs are stored in the Bucky controller. There are 16 programs available.

NOTE

Figures show default values

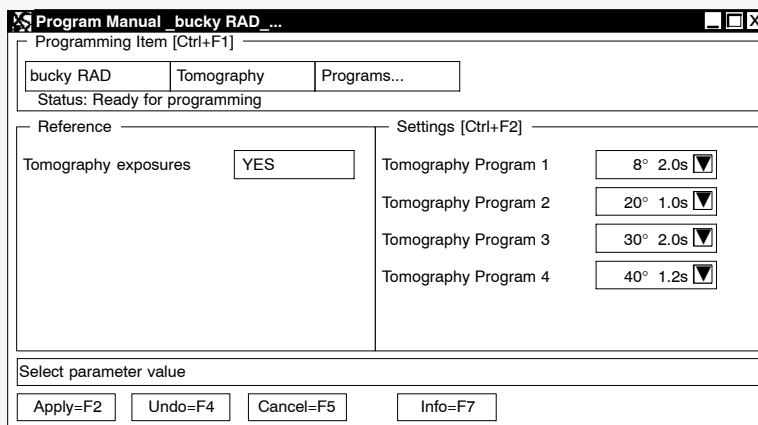
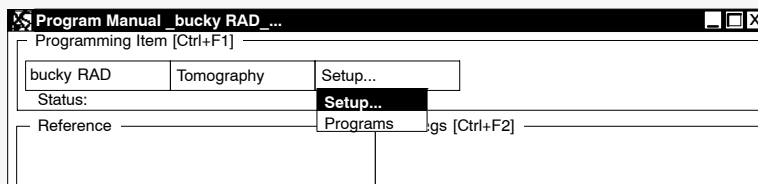
- Click on the ▼ or ▲ button for more selections.
- Highlight the required parameter.
- To store click on *Apply=F2*

- Click on *Tomography* to open the selection menu.

NOTE

Make a note of the related tomography program number.

This is later on required for the APR data programming of the generator.



<input type="checkbox"/>	8°/0.8s -> 0
<input type="checkbox"/>	8°/1.0s -> 1
<input type="checkbox"/>	8°/2.0s -> 2
<input type="checkbox"/>	20°/0.8s -> 3
<input type="checkbox"/>	20°/1.0s -> 4
<input type="checkbox"/>	20°/2.0s -> 5
<input type="checkbox"/>	20°/3.0s -> 6
<input type="checkbox"/>	30°/0.8s -> 7
<input type="checkbox"/>	30°/1.0s -> 8
<input type="checkbox"/>	30°/2.0s -> 9
<input type="checkbox"/>	30°/3.0s -> 10
<input type="checkbox"/>	30°/4.0s -> 11
<input type="checkbox"/>	40°/1.2s -> 12
<input type="checkbox"/>	40°/2.0s -> 13
<input type="checkbox"/>	40°/3.0s -> 14
<input type="checkbox"/>	40°/4.0s -> 15

The fixed values of the tomography programs 0 ... 15 are corresponding to the generator settings.

9.1.11. Tracking

This menu configures all parameters that are involved in the ceiling suspension with tracking.

- Select *Tracking*.

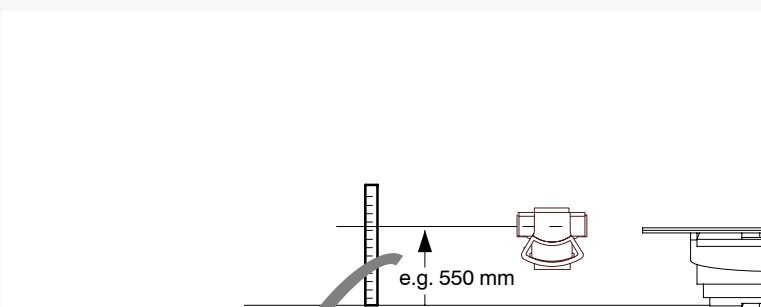
NOTE

Settings in the figure are default values.

NOTE

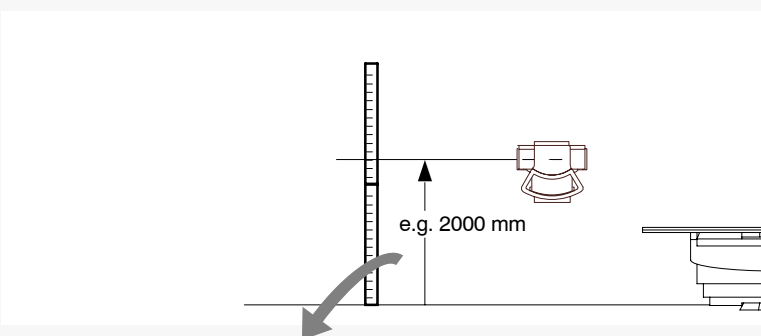
Perform the section 10.2 “Adjustment of ceiling suspension height” first and then proceed with the adjustment of the tracking positions.

- Use the cursor to select or modify the required items.
- Click the ▼ or ▲ button for more selections.
 - Highlight the parameter
- To store click on *Apply=F2*
- Click on *Tracking* to open the selection menu.



Low Tracking Pos [mm]

This limit depends on the installation site. Limit of the lowest position of the ceiling suspension, measured from ground to the red marked focal point on tube.



High Tracking Pos [mm]

This limit is depending on the locality. Limit of the highest position of the ceiling suspension, measured from ground to the red marked focal point on tube.

Collision Curr Limit [mA]

Limit of the current strength supplied to the tracking motor.

Setting range = 1000 ... 4000 mA.

2800 mA = set by factory for Bucky CS

2000 mA = set by factory for Bucky FS

Tracking on PowerUp

On ▼
Off
On

☐ Enables tracking

☐ Disables tracking

NOTE

Set the "WS Pick-up Band" in accordance to the room height.

- After all programmings are finished, switch **OFF** the system and restart the system again 10 s later.
This guarantees that all data is handled correctly by the Bucky controller board.

Table Pick-up Band [mm]

Default = 300 mm.

If the table or the tilted wall stand (90°) is in this band, the ceiling suspension is in the track mode, 10 mm ... 1000 mm .

WS Pick-up Band [mm]

The maximum value is twice the minimum distance focus - floor.

E.g. :

min. distance focus - floor = 350 mm

max. value "WS Pick-up Band" = 700 mm

If the tilted wall stand is in this band, the ceiling suspension will track, 10 mm ... 1000 mm.

Tracking Def SID [mm]

Default = 1100 mm.

SID = **S**ource **I**mage **D**istance for the table or the tilted wall stand, which is hold by the tracking option, 0 mm ... 3000 mm.

Override with Grid SID

NO ☐
NO ☒
 YES ☐

Override 'Tracking Def SID' with

☐ the SID of the installed grid.☐ Only applicable if a BUF is installed.

coded catch plates for SID positions as delivered



SID position x



SID position x+1

CS2 / CS4

Line of Focal Point

VE / VT

Pick-up Band
+/- 150 mm = 300 mm

SID = constant distance

Film surface

Pick-up Band
+/- 150 mm = 300 mm

SID = constant distance

Tracking = Value of motion of
Table height or
Wallstand height

TH

PHILIPS

Film surface
or
sensitive layer of the
digital detector (FSXD)

Table ground, floor

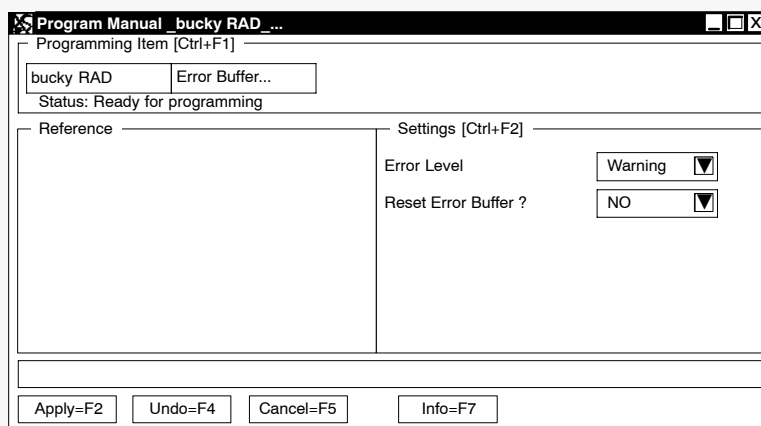
9.1.12. Error buffer

In this menu the behaviour of the error buffer is defined.

- Select *Error Buffer*.
- Click the ▼ button for more selections
 - Highlight the parameter.
- To store click on *Apply=F2*

To check the error log refer to 11. “Faultfinding.”

Before exiting X-Scope set *Error Level* to *Warning*.



Error Level	Warning ▼	
	Information	<input type="checkbox"/>
	Warning	<input checked="" type="checkbox"/>
	Error	<input type="checkbox"/>
	Fatal	<input type="checkbox"/>

Information = the most detailed level
 Warning = warning + error + fatal level
 Error = error + fatal level
 Fatal = only fatal level

9.2. End configuration procedure

- Make sure that all settings are stored and click on *Apply=F2*

Reset Error Buffer ?	NO ▼	
	NO	<input checked="" type="checkbox"/>
	YES	<input type="checkbox"/>

YES = Error Buffer will be reset.
 After resetting the setting changes back to NO (will be shown after changing to another menu item)

Important:

- Click *Cancel=F5* to proceed with the adjustment procedure subsequently.

10. Adjustments

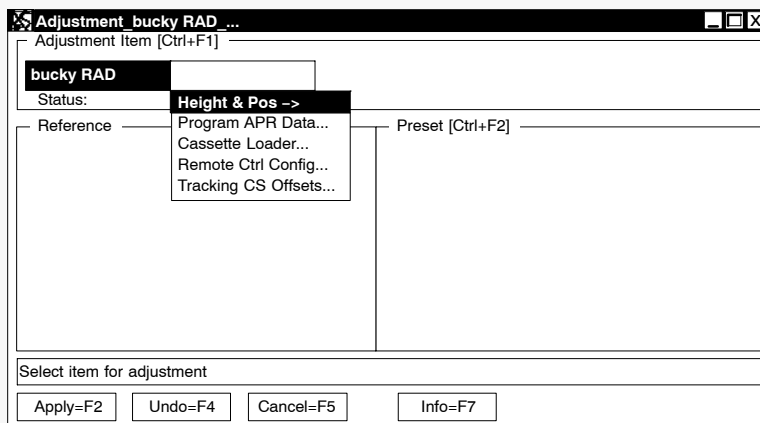
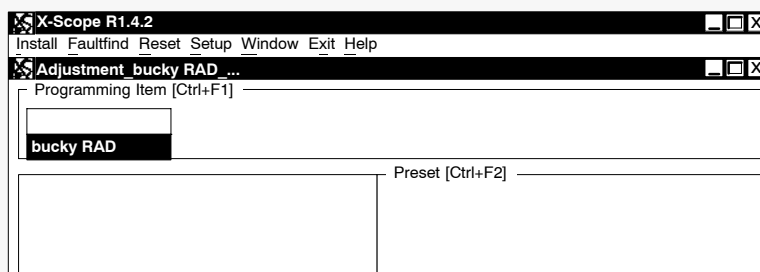
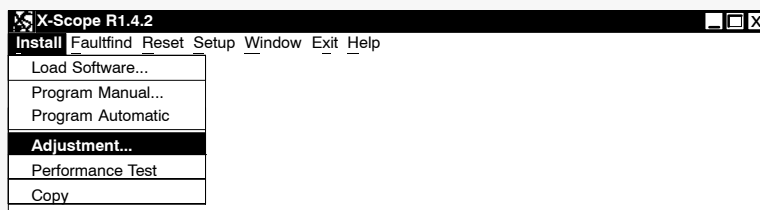
Make sure that the programming procedure is cancelled before the adjustment procedure is started.

- Click *Install*
- Select *Adjustment* with *Enter* key.
- Select *bucky RAD* with *Enter* key.

Wait until the screen on the right appears.

NOTE

Depending on the system configuration not all adjustments are necessary. Not configured items are shown in brackets [...]. See also 9.1 “Manual Programming”.



10.1. Adjustment of table height

NOTE

Keep in mind that the table height measuring points have changed!

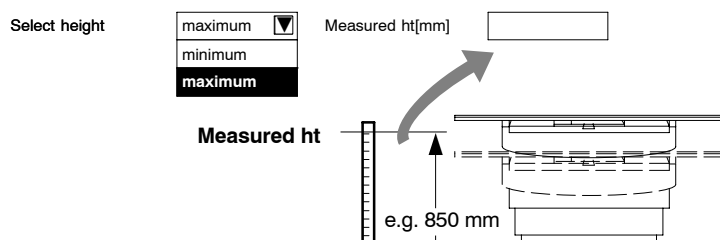
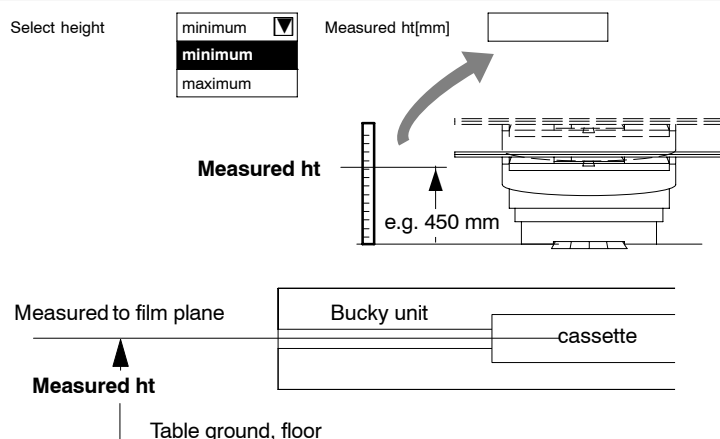
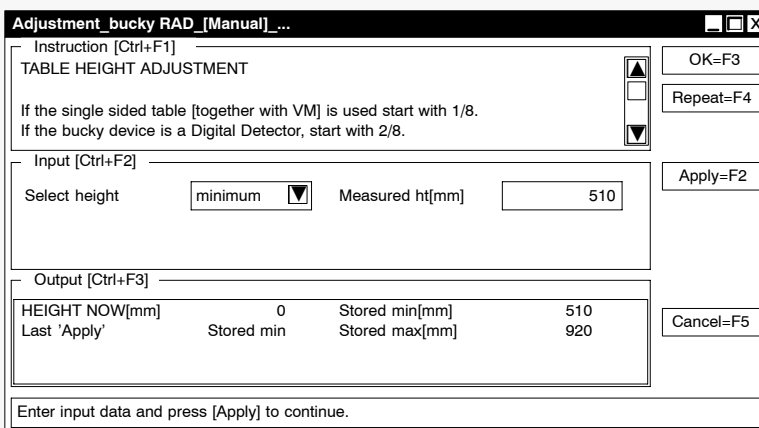
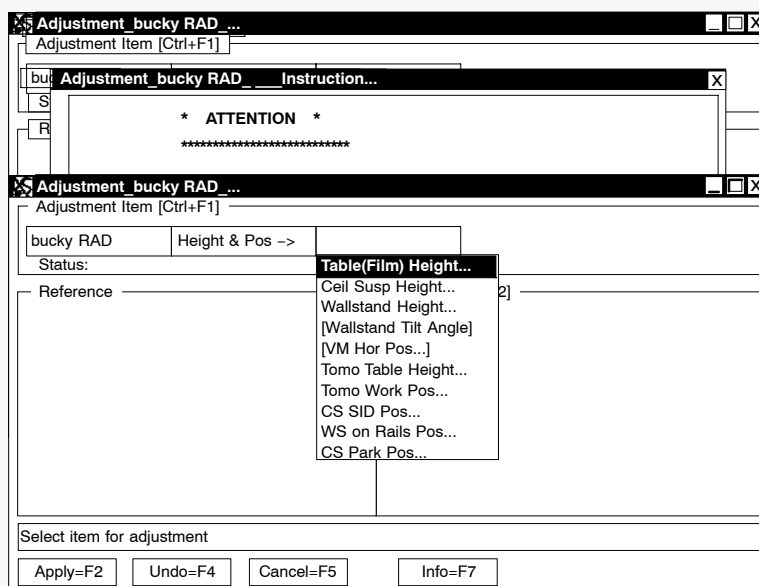
With this adjustment the analogue table height input is calibrated and checked for valid ranges. Furthermore the values for maximum and minimum height are set and the table height linearity factor is calculated.

- Select *Table Height*.
- Start with *Enter* key
- Follow the instructions.
- Use the scroll-bar to read the instructions.

NOTE

The shown values only are examples.

- Use the cursor to select the input field *Measured ht*.
- To store click *Apply=F2* or repeat the procedure with *Repeat=F4*.
- Follow the instructions.
- Enter with *OK=F3* for the next step.
- Enter the measured value.



10.2. Adjustment of ceiling suspension / floor stand height

This adjustment calibrates the analogue height input for the ceiling suspension / floor stand and calculates the height linearity factor. For BuckyDiagnost FS use Ceiling Suspension items

NOTE

It is enabled only if:

Collimation type = Automatic.

Refer to sub-menu

Program Manual - Ceiling Suspension

- Select *Ceil Susp Height*
- Start with *Enter* key
- Follow the instructions in the screen.
- Use the scroll-bar to read the instructions.

NOTE

The values are examples only. They are different for each system.

- Use the cursor to select the input field *Measured Ht* .
– Enter the measured value.

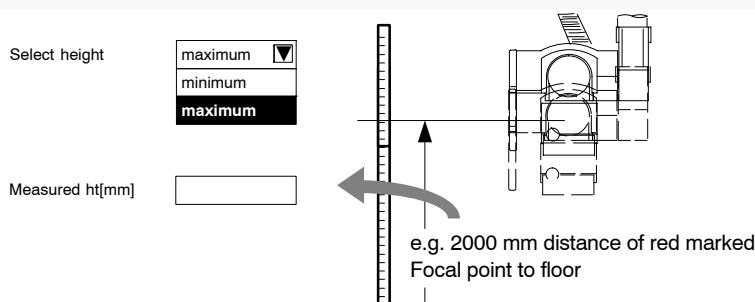
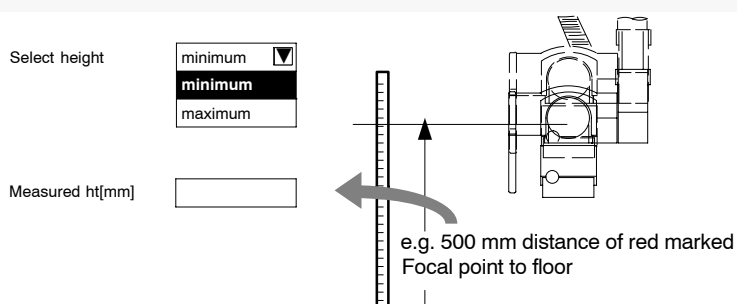
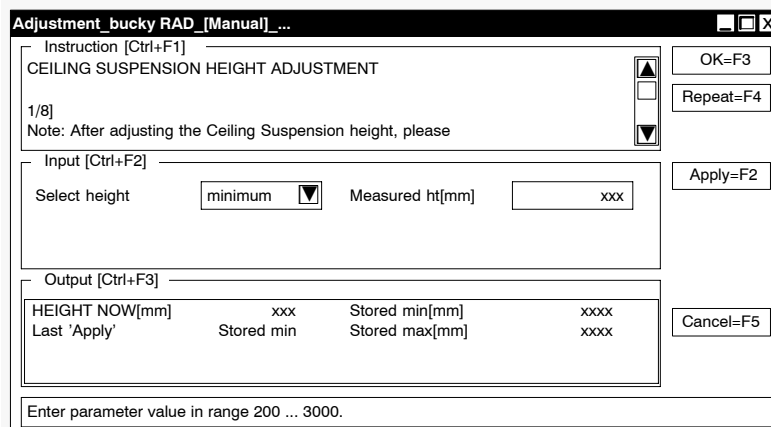
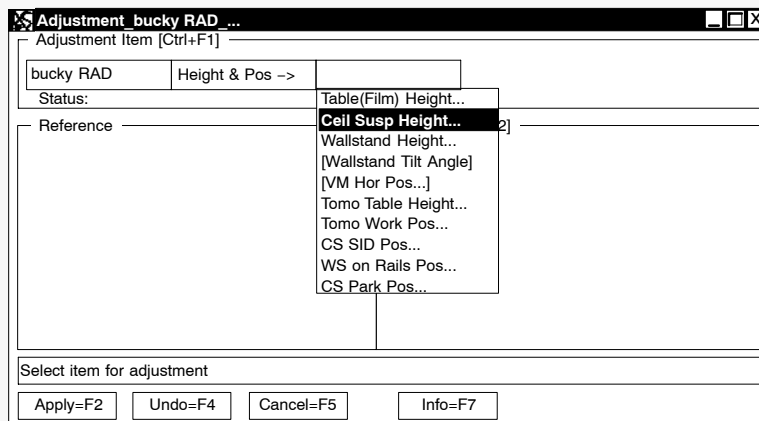
- To store click on *Apply=F2*
or
the procedure can be repeated with *Repeat=F4*.

Follow the instruction items in the screen up to item 8.

- Confirm with *OK=F3*.

NOTE

After the adjustments of the CS/FS height are finished re-adjust the settings of Low Tracking Pos and High Tracking Pos, refer to 9.1.10 "Tracking".



10.3. Adjustment of wallstand height

This adjustment stores the minimum and maximum wallstand height in the Bucky controller for calculating correct tracking operations.

NOTE

It is enabled only if:

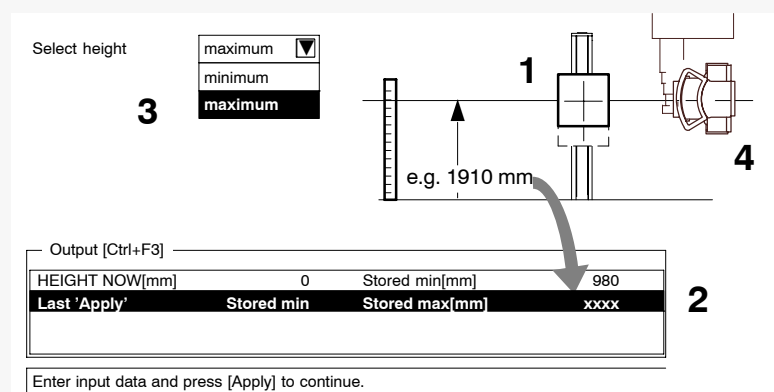
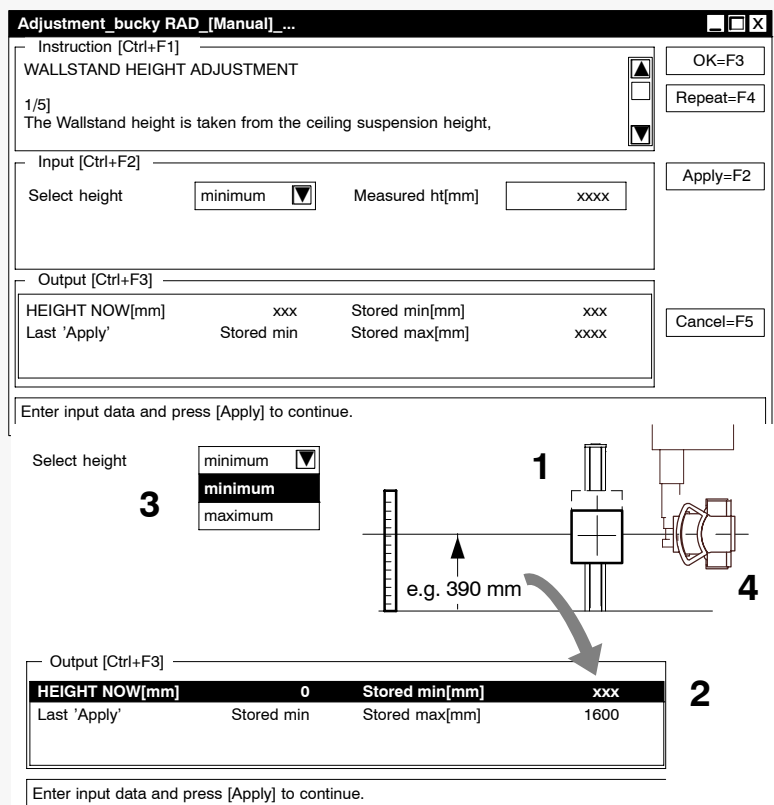
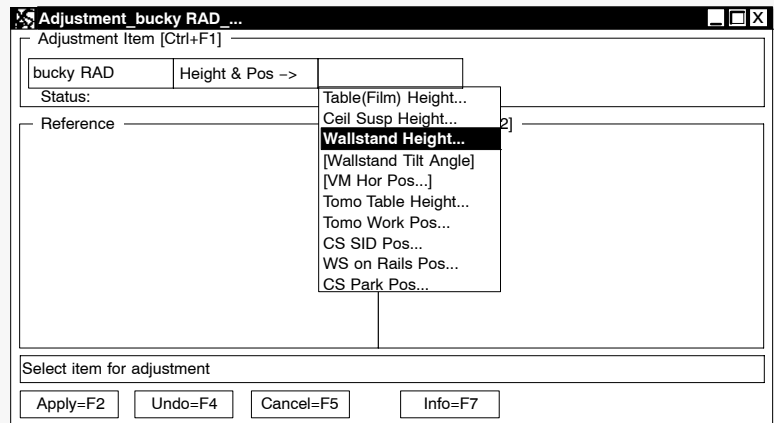
Wallstand exposures = YES

Refer to sub-menu Room Configuration

- Select *Wallstand Height*.
- Start with *Enter* key.
- Follow the instructions in the screen.
- Use the scroll-bar to read the instructions.

- To store *click on Apply=F2*
or
the procedure can be repeated
with *Repeat=F4*.

- Follow the instructions.
 - Respect instruction order 1 ... 4.
- Confirm with *OK=F3* for the next step.



10.4. Adjustment of wallstand tilt angle

With this adjustment the analog position of the wallstand (0° / 90°) is calibrated.

- Select *wallstand tilt angle*.
- Start with *Enter* key.
- Follow the instructions.

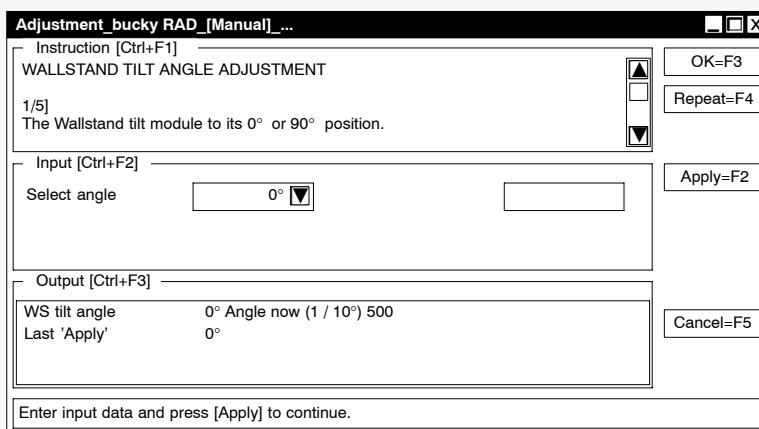
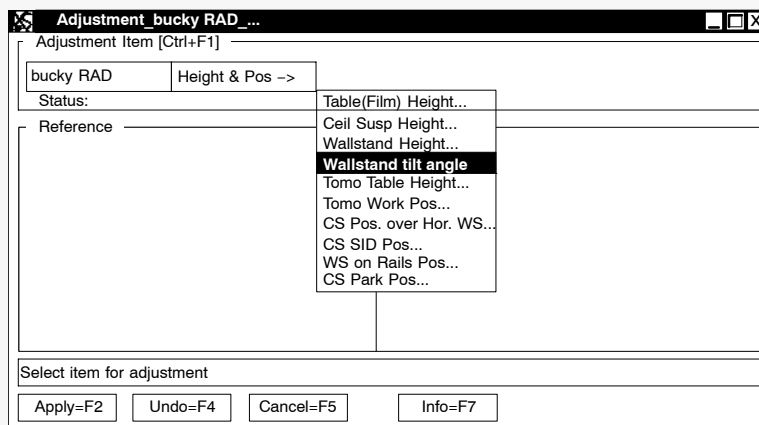
- Use the scroll-bar to read the instructions.



Note

*The value shown are examples only.
They are different for each system.*

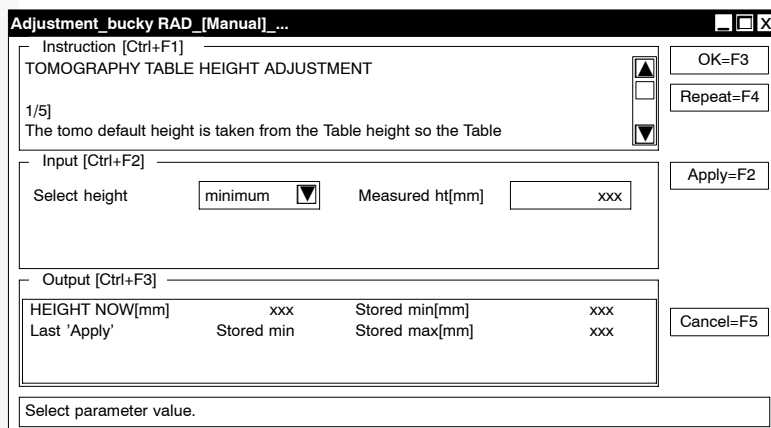
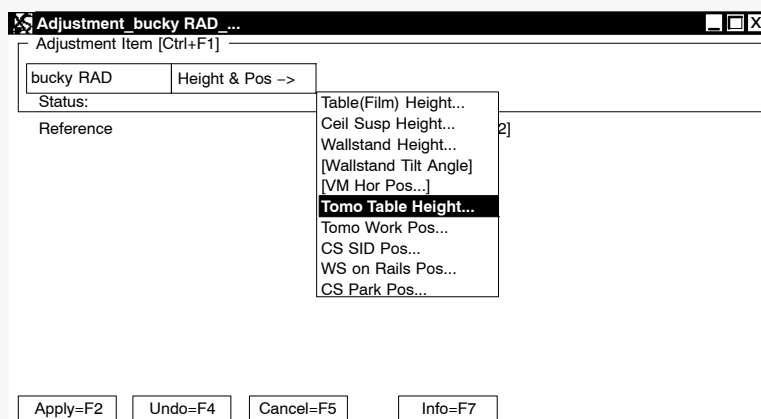
- Use the cursor to select the angle.
- Click on *apply* = *F2* to store the calculated value.
- Repeat the procedure for the other angle.
- Confirm with *OK* = *F3* for the next step.



10.5. Adjustment of tomography table height

This adjustment calibrates the default working height of the Bucky table and takes into account the hysteresis of the 750mm switch.

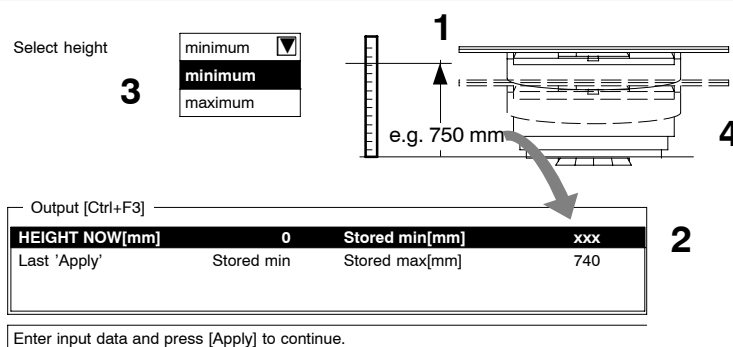
- Select *Tomo Table Height*.
- Start with *Enter* key.



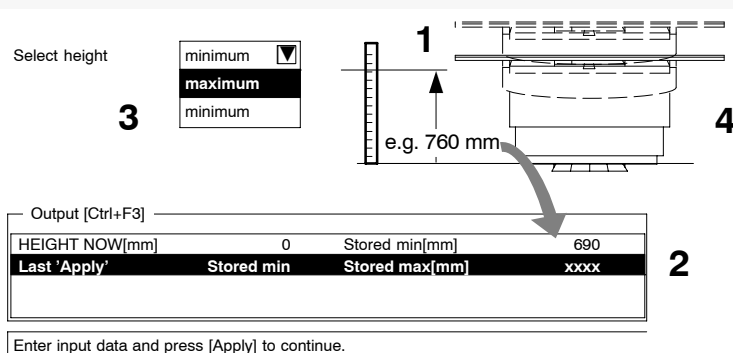
- Follow the instructions 1 ... 5 in the screen.
- Use the scroll-bar to read the instructions.



- Follow the instructions.
 - Respect instruction order 1 ... 4.
- To store click on *Apply=F2* or the procedure can be repeated with *Repeat=F4*



- Confirm with *OK=F3* for the next step.



10.6. Adjustment of tomo working position CS/FS

This adjustment stores the default **tomography working position** in the bucky controller.

- Press footswitch and move table from bottom to middle position
- Move bucky table from bottom to the middle position by pressing the footswitch.

The table stops automatically in the middle position.

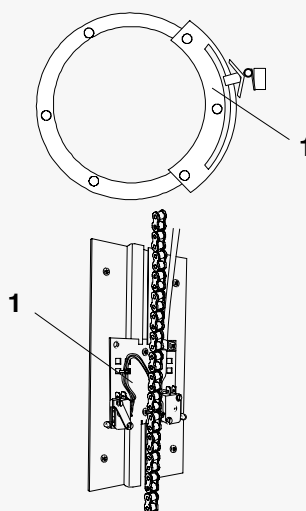
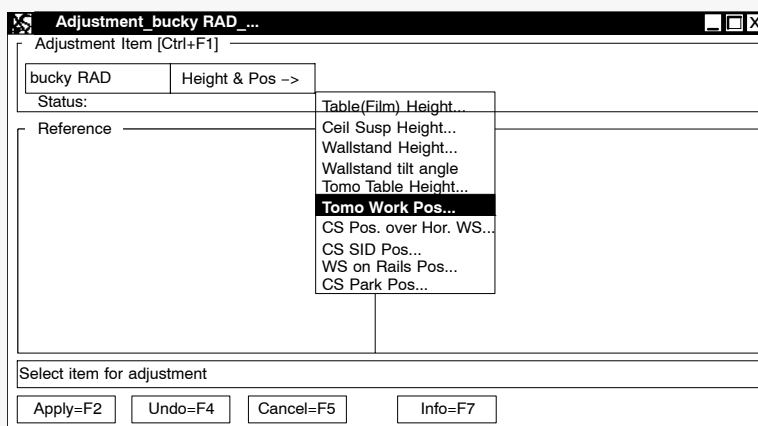
- Move the ceiling suspension / floor stand manually from lowest to the tomography working position (usually 110 cm).
 - Make sure that the control panel display shows the correct SID (usually 110 cm).
- Check the position of the switch of the Z-axis. The switch must be closed.

- Follow the instructions.
- Use the scroll-bar to read the instructions.
- Move ceiling suspension into
 - longitudinal notch
 - transverse notch
 - height position.



If the screen shows *Valid* for all axes.

- Click on *Apply=F2*
- Click on *OK=F3*.



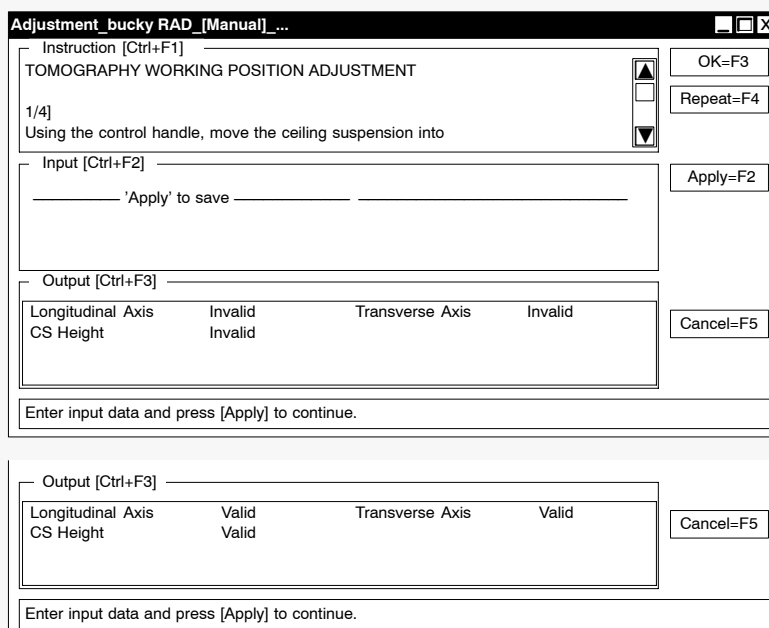
Bucky Diagnost CS:

The tomo Z-position is adjusted by the plate (1). The switch of tomo Z-position must be closed. If it is not closed, adjust the notch to the correct position.

The switch spring must not be damaged by the actuation cam.

Bucky Diagnost FS:

The tomo Z-position is adjusted by moving the holder plate (1). The holder plate is located behind the column front cover.

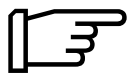


10.7. CS Position over horizontal wallstand adjustment

This adjustment calibrates the working position of a tilted (=horizontal) wallstand.

- Select *CS Pos. over Hor. WS*
- Start with *Enter* key.

- Follow the instructions on the screen (1 ... 3).

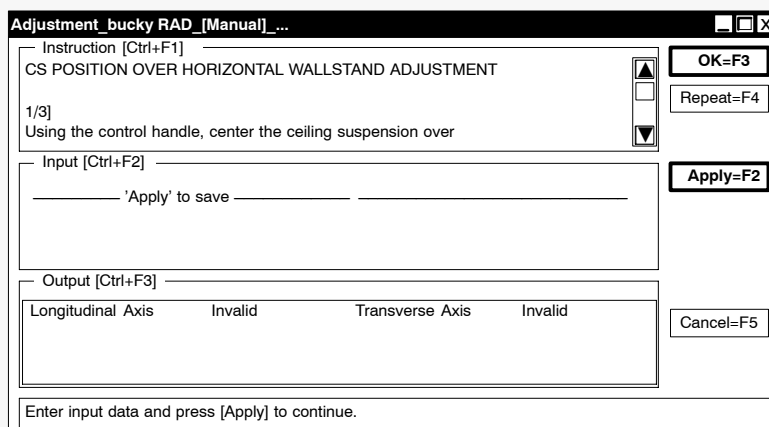
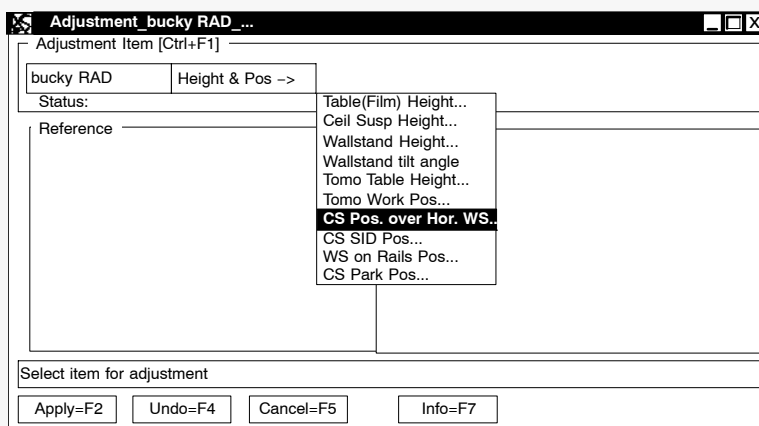


WARNING

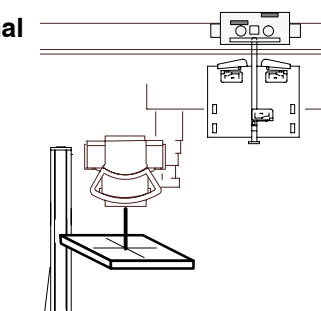
Make sure that the CS is locked in the longitudinal and the transverse catch plate.

- Click on *Apply=F2* to store the calculated offset.
- Confirm with *OK=F3* for the next step.

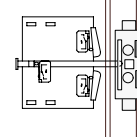
The procedure can be repeated with *Repeat =F4*.



longitudinal catch



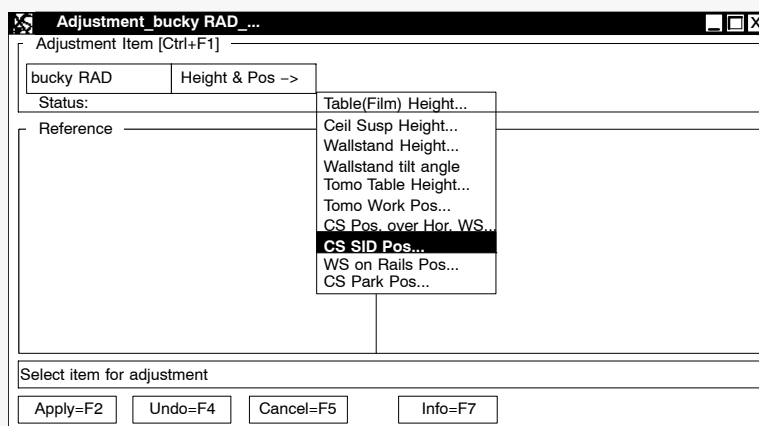
transverse catch



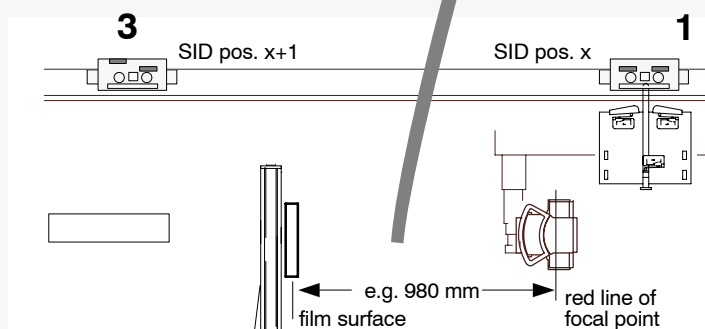
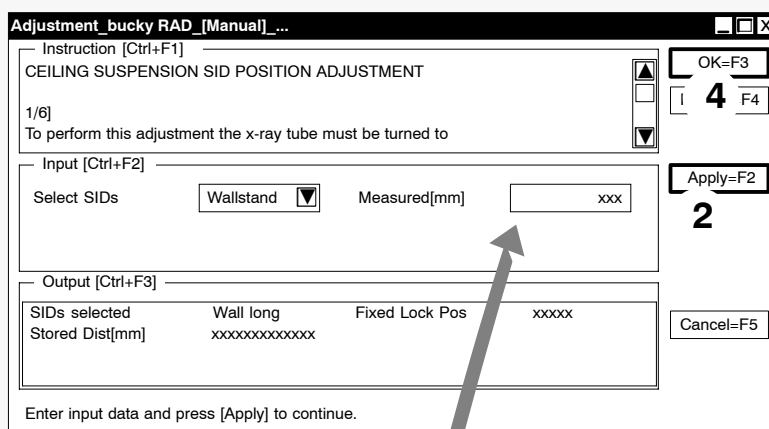
10.8. Adjustment of CS/FS SID positions

This adjustment calibrates the positions of the fixed SID sensors.

- Select *CS SID Pos.*
- Start with *Enter* key.

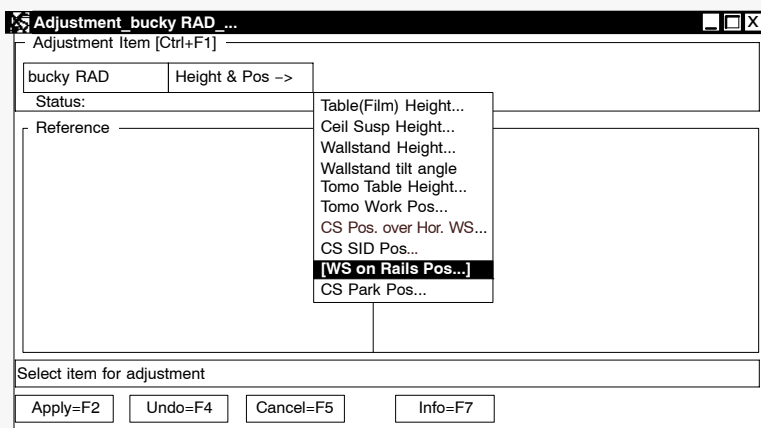


- Follow the instructions.
- Use the scroll-bar to read the instructions.
- **1** Position the ceiling suspension into the required SID position.
- To change the current distance select the input field *Measured [mm]* with the cursor and enter the measured value.
- **2** Click on *Apply=F2* to save the measured value.
- **3** Repeat procedure for all other SID positions.
- **4** Confirm with *OK=F3* for the next step.



10.9. Position adjustment for the wallstand on rails

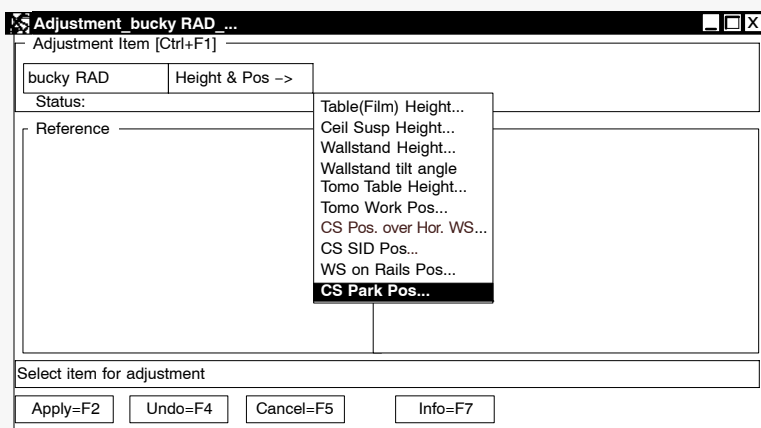
Not available for BuckyDiagnost!



10.10. Adjustment of the Parking Position of the SECOND CS

Note

Only for system with SECOND CS and tomography.



10.11. Adjustment of program APR data

The select generator APRs will be stored in the bucky RAM.

- Select *Program APR Data*.

- Start with *Enter* key.

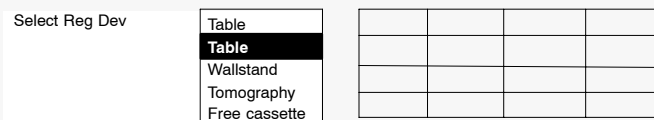
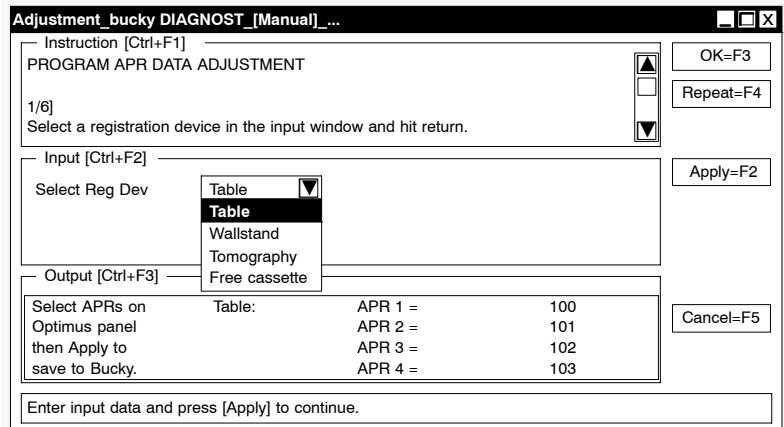
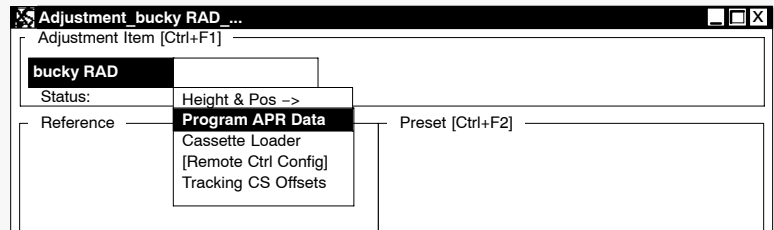


- Follow the instructions 1 ... 6 on the screen.

- Select a device.

- To store *click Apply=F2*.

- Confirm with *OK=F3* for the next step.



10.12.Adjustment of cassette loader

This adjustment calibrates the cassette tray of BuckyDiagnost VE/VT, VE2/ VT2 and TH/TH2 with cassette format sensing.

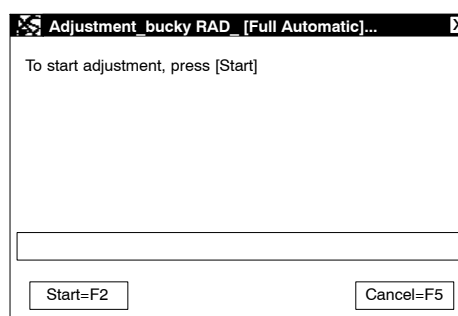
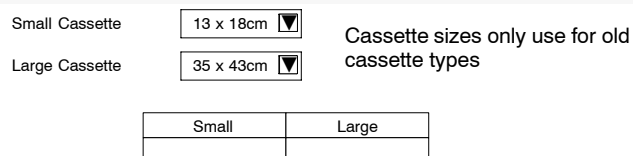
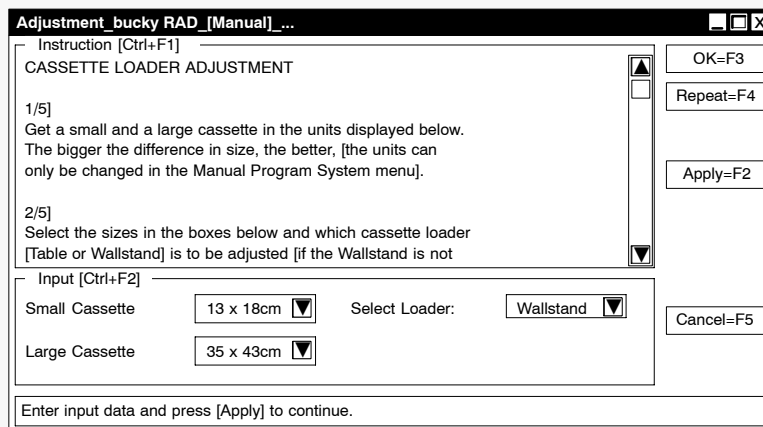
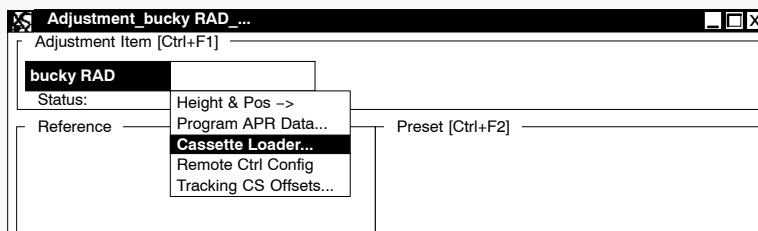
This menu item is available if:

Cassette Sensing = YES is configured, refer to *Wallstand*.

- Select *Cassette Loader*.
- Start with *Enter* key.
- Follow the instructions **1 ... 5** on the screen.
- Use the scroll-bar to read the instructions.
- Select *Table* or *Wallstand*.



- Use the cursor to select the right cassette size.
- To store click on *Apply=F2*
or
the procedure can be repeated with *Repeat=F4*.
- Follow the instructions on the screen.
- Confirm with *OK=F3* for the next step.

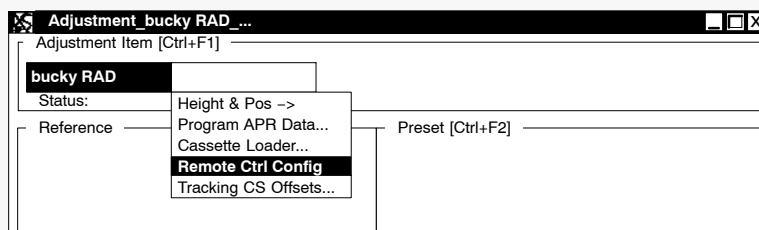


10.13. Adjustment of Remote Control Configuration

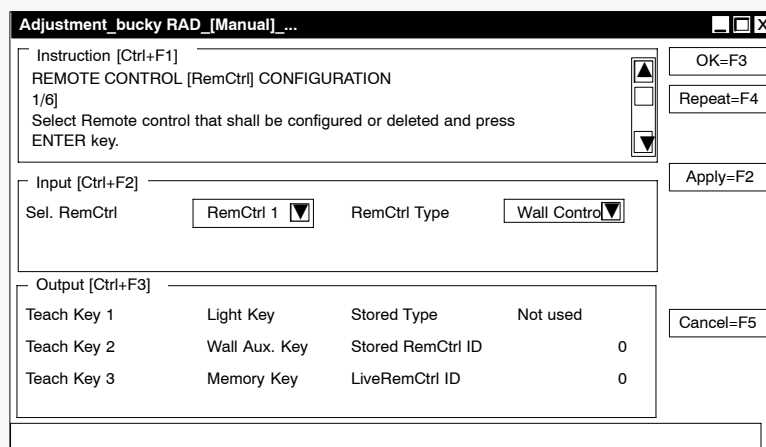
For the remote control of a Digital Diagnost VM and BuckyDiagnost VS digital only!

This adjustment registers 1 to 4 remote controls to a VM or VS digital.

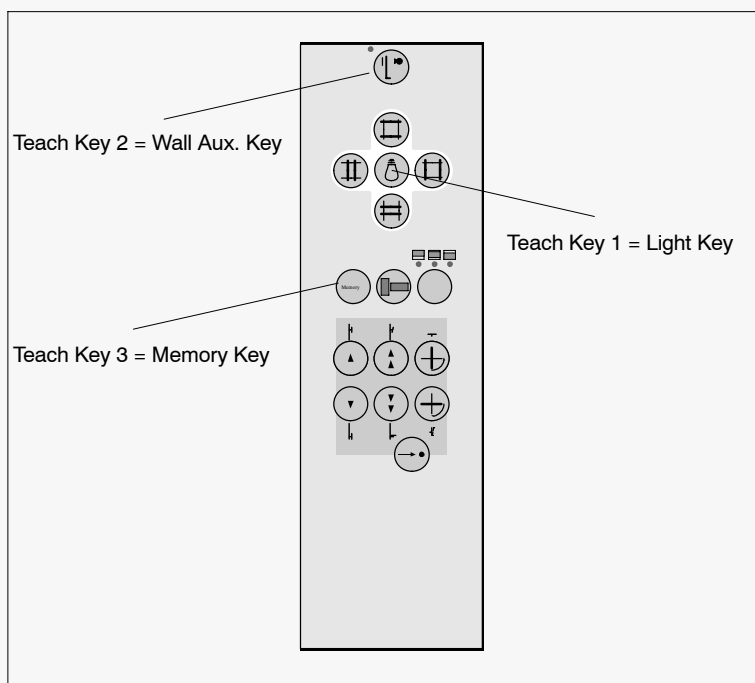
- Select Remote Control Config.
- Start with Enter key.



- Follow the instructions on the screen (1...6).
- Use the scroll-bar to read the instructions.



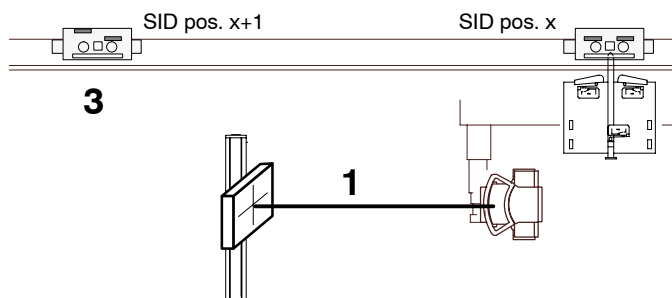
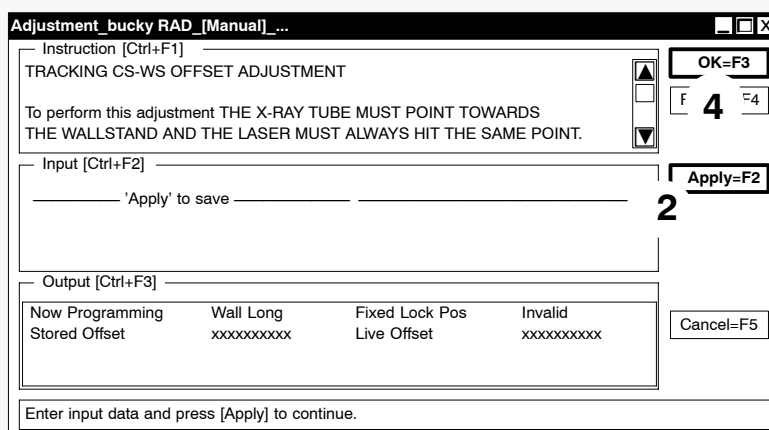
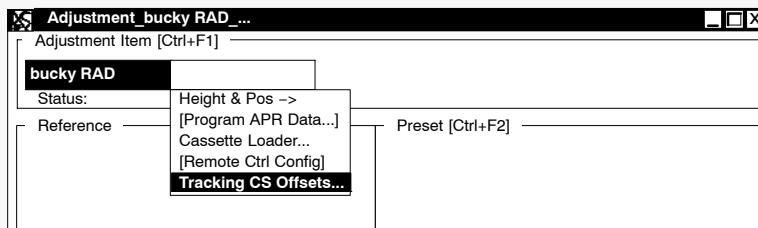
- To store click on Apply = F2.
- Confirm with OK = F3 for the next step.



10.14. Adjustment of tracking CS/FS offset

This adjustment eliminates the deviation at several SID positions.

- Select *Tracking CS Offsets*.
- Start with *Enter* key.
- Follow the instructions on the screen.
- Move the ceiling suspension into the required SID position.
- **1** Center the laser line on the wallstand.
- **2** Click on *Apply=F2* to save the calculated offset.
- **3** Repeat the procedure for all other SID positions.
- **4** Confirm with *OK=F3* for the next step.



11. Faultfinding

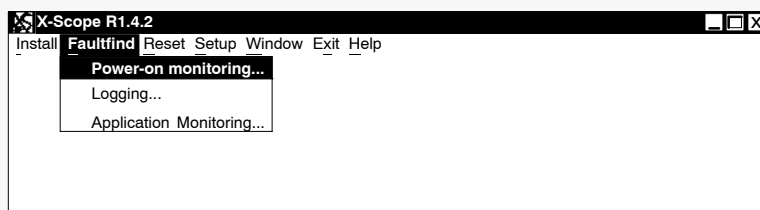
- Select *Faultfind*

The sub-menus '*Application Monitoring...*' is not yet implemented.

11.1. Power-on monitoring

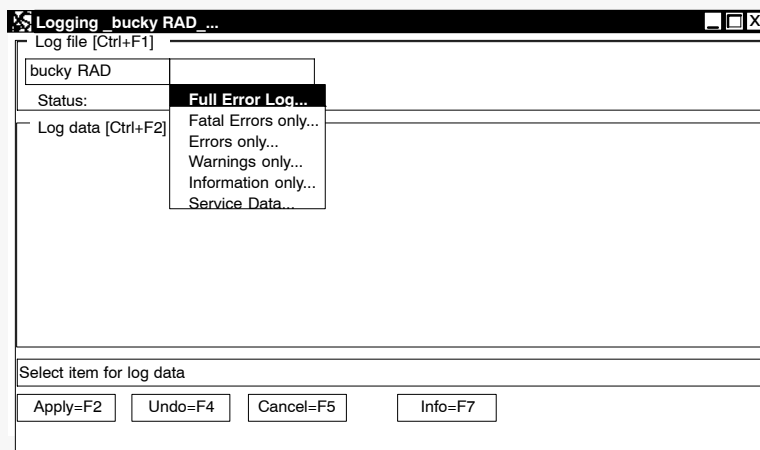
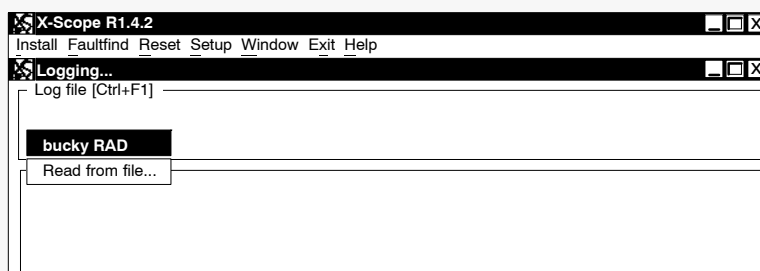
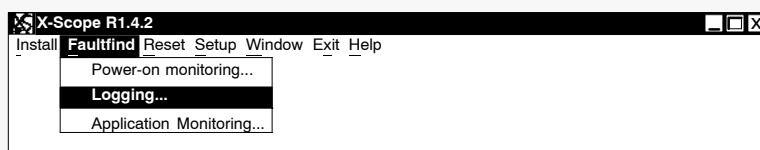
- Select *Power-On monitoring*.
- Start the *Enter* key.

The power-on monitoring (=> VT100) is started.



11.2. Logging

- Select *Logging*.
- Start with *Enter* key.
- Select *bucky RAD*.
- Start with *Enter* key.
- Select the required log file.
- Start with *Enter* key.



The cursor in the log data field blinks until the data list appears.

11.2.1. Saving data

Data can be saved to disk with *Save=F2*.

Enter file name, path, drive and description in the pop-up screen. Modify the file extension to .txt to read it with a table calculation program or editor.

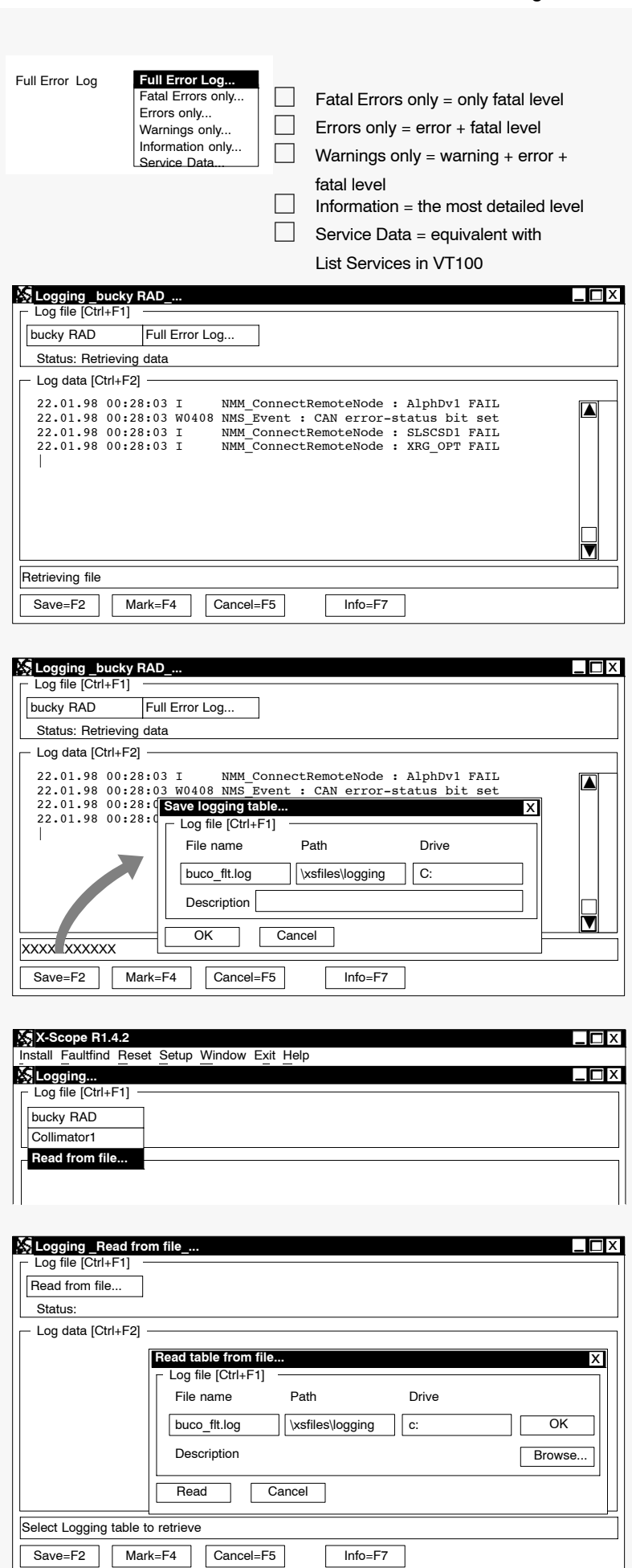
11.2.2. Reading data

Stored data can be re-read from disk or floppy.

- Select *Read from file*.
- Start with *Enter* key.

The following window appears.

- Write in the file name, path and target drive.
If the target is unknown, *click* on *Browse* and select the target.
- Confirm with *OK*.



12. Finishing X-Scope

- Switch *OFF* the system and switch *ON* again after 10s.
This activates all modifications and adjustments.

13. Detailed instruction text (screens)

13.1. Adjustment of table height



Adjustment_bucky RAD_[Manual]_...

Instruction [Ctrl+F1]

TABLE HEIGHT ADJUSTMENT

If the single sided table [together with VM] is used start with 1/8.
If the bucky device is a Digital Detector, start with 2/8.
Input [Ctrl+F2]

0/8)
If the bucky device is a cassette loader:
insert a 24x30 cassette landscape into the tray and
move it halfway in. Be sure that the cassette is
horizontal referred to the floor.

Move the Table to its 'Minimum' or 'Maximum' possible
height using the foot switches.

Measure the distance (in mm) from the floor to the upper
surface of the cassette and subtract 2 mm from the
measured value. Continue with 3/8.

1/8
If the single sided table [together with VM] is used:
Near the table base, measure the distance [in mm] from the floor to
the uppersurface of the tabletop.
Continue with 3/8.

2/8)
If the bucky device is a Digital Detector:
Move the Table to its 'Minimum' or 'Maximum' possible
height using the foot switches.

Measure the distance (in mm) from the floor to the
sensitive layer of the Digital Detector.

3/8)
Check to see if the value you have measured corresponds
to the 'Stored' value in the output window.

4/8)
If it does NOT, select 'Minimum' or 'Maximum' and enter
the correct height (in mm) into the input field labelled
'Measured ht(mm)' in the input window.

5/8)
Transfer the value you have just entered to the Bucky
system by pressing the 'Apply' button.

6/8)
'Stored' and 'HEIGHT NOW' should show the value just
entered and 'Last Apply' should show the last updated
height.

7/8)
Repeat the procedure for the other height measurement.

8/8)
Press 'OK' to exit the adjustment.

OK=F3
Repeat=F4
Apply=F2
Cancel=F5

13.2. Adjustment of CS/FS height



Adjustment_bucky RAD_[Manual]_...

Instruction [Ctrl+F1]
CEILING SUSPENSION HEIGHT ADJUSTMENT

1/8)
 Note: After adjusting the Ceiling Suspension height please check the Tracking software limits (Low/High Tracking Pos) in the Manual Programming menu for Tracking, if Tracking is fitted.

Move the ceiling suspension to its 'Minimum' or 'Maximum' possible height, moving it clear of the Table if necessary.

2/8)
 With the ceiling suspension pointing towards the Table, measure the distance (in mm) from the floor to one of the red horizontal marks located on the back and the front of the x-ray tube.

3/8)
 Check to see if the value you have measured corresponds to the 'Stored' value in the output window.

4/8)
 If it does NOT, select 'Minimum' or 'Maximum' and enter the correct height (in mm) into the input field labelled 'Measured ht(mm)' in the input window.

5/8)
 Transfer the value you have just entered to the Bucky system by pressing the 'Apply' button.

6/8)
 'Stored' and 'HEIGHT NOW' should show the value just entered and 'Last Apply' should show the last updated height.

7/8)
 Repeat the procedure for the other height measurement.

8/8)
 Press 'OK' to exit the adjustment.

Navigation buttons: ▲, □, ▼

Buttons: OK=F3, Repeat=F4, Apply=F2, Cancel=F5

13.3. Adjustment of wallstand height



Adjustment_bucky RAD_[Manual]_...

Instruction [Ctrl+F1]
WALL STAND HEIGHT ADJUSTMENT

1/5)
The Wallstand height is taken from the ceiling suspension height, so the ceiling suspension adjustment MUST be done first. Move the Wallstand and the ceiling suspension to their 'Minimum' or 'Maximum' possible heights, with the ceiling suspension facing the Wallstand and the laser always hitting the center of the Wallstand at the same point.

2/5)
Select the corresponding 'minimum' or 'maximum' selection in the output window and press 'Apply'. Note 'Measured ht(mm)' is NOT used.

3/5)
'Stored' and 'HEIGHT NOW' should show the same correct value and 'Last Apply' should show the last updated height.

4/5)
Repeat the procedure for the other height measurement.

5/5)
Press 'OK' to exit the adjustment.

OK=F3
Repeat=F4
Apply=F2
Cancel=F5

13.4. Adjustment of tomography table height



Adjustment_bucky RAD_[Manual]_...

Instruction [Ctrl+F1]
TOMOGRAPHY TABLE HEIGHT ADJUSTMENT

1/5)
The tomo default height is taken from the Table height so the Table adjustment MUST be done first. Move the Table to the LOWEST and HIGHEST tomography working positions, by moving the Table to its lowest or highest normal Table position and moving back until the min and max tomography working positions are reached.

2/5)
Select the corresponding 'minimum' or 'maximum' selection in the input window and press 'Apply'. Note 'Measured ht(mm)' is NOT used. NOTE: If the minimum height is larger than 'Stored max(mm)', then save the maximum height first.

3/5)
'Stored' and 'HEIGHT NOW' should show the same correct value and 'Last Apply' should show which the last updated height.

4/5)
Repeat the procedure for the other height measurement.

5/5)
Press 'OK' to exit the adjustment.

OK=F3
Repeat=F4
Apply=F2
Cancel=F5

13.5. Adjustment of tomo working position



Adjustment_bucky RAD_[Manual]_...

Instruction [Ctrl+F1]

TOMOGRAPHY WORKING POSITION ADJUSTMENT

1/4)
Using the control handle, move the ceiling suspension into the tomography working position.

2/4)
Check the output box in the adjustment window. The items 'Longitudinal Axis', 'Transverse Axis' and 'CS Height' should all be set to VALID. If they are not, inspect the switches on the axis to check that they are operating properly.
HINT: First check to see that the LEDs are lit on the control handle.

3/4)
If you wish to use the current position as the tomo working position: press 'Apply'.
If you DO NOT want to use the current position as the tomo working position, and leave the old working position, do not press 'Apply'.

4/4
Press 'OK' to exit the adjustment.

OK=F3
Repeat=F4
Apply=F2
Cancel=F5

13.6. Adjustment of CS/FS SID positions



Adjustment_bucky RAD_[Manual]_...

Instruction [Ctrl+F1]

CEILING SUSPENSION SID POSITION ADJUSTMENT

1/6)
To perform this adjustment the x-ray tube must be turned to +90 or -90 degrees and pointing towards the Wallstand,

NOTE: 'Stored Dist(mm)' values marked as 'xxxxxxxxxxxx' indicate the system is not yet in the correct position.

2/6)
Move the ceiling suspension to EACH fixed SID position.

3/6)
For the Wallstand, measure the distance between the focal point of the tube (marked with a red line) and the front of the film cassette (with the cassette tray pulled out) or the sensitive layer (marked with a line on the front of the detector box).

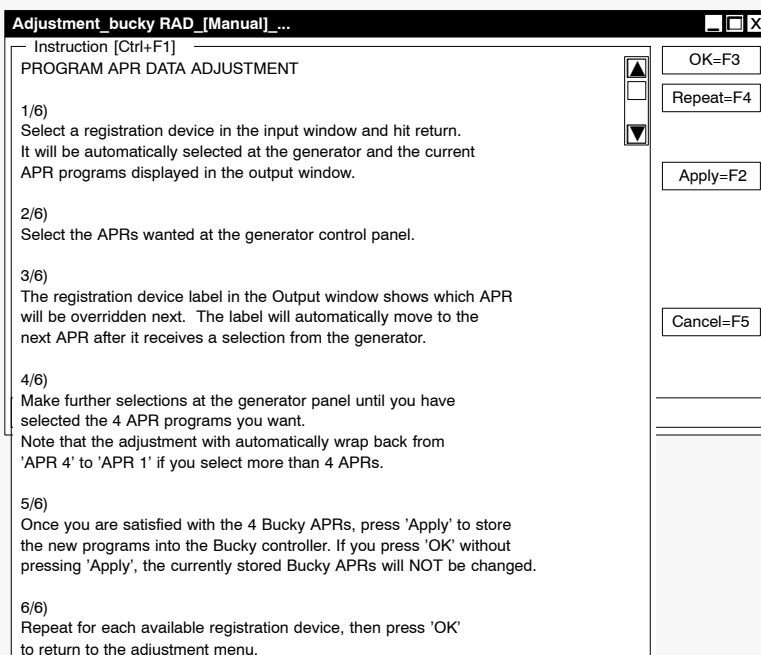
4/6)
If the measured value does not match the 'Stored Dist(mm)' displayed in the output window, then input the measured value (in mm) into the box labelled 'Measured(mm)' in the input window and press 'Apply'.

5/6)
Repeat for each SID position.

6/6)
When you are satisfied with ALL SIDs press 'OK' to complete the adjustment.

OK=F3
Repeat=F4
Apply=F2
Cancel=F5

13.7. Adjustment of program APR data



13.8. Adjustment of cassette loader



Adjustment_bucky RAD_[Manual]_...

Instruction [Ctrl+F1]

CASSETTE LOADER ADJUSTMENT

1/5)
Get a small and a large cassette in the units displayed below.
The bigger the difference in size, the better, (the units can only be changed in the Manual Program System menu).

2/5)
Select the sizes in the boxes below and which cassette loader (Table or Wallstand) is to be adjusted (if the Wallstand is not configured or doesn't have cassette sensing, it will not be accepted).

3/5)
Send the selection to Bucky by pressing 'Apply'.
The registration device will be automatically selected at the generator.

4/5)
INSERT THE SMALL CASSETTE INTO THE SELECTED CASSETTE LOADER, with the longest edge of the cassette parallel with the front edge of the cassette loader.

5/5)
Press 'OK' to start the automatic adjustment.
IF YOU DO NOT WANT TO CONTINUE WITH THE ADJUSTMENT THEN PRESS 'Cancel'.

OK=F3
Repeat=F4
Apply=F2
Cancel=F5

13.9. Adjustment of the Remote Control



Adjustment_Digit.Diagnost_[Manual]_...

Instruction [Ctrl+F1]

REMOTE CONTROL CONFIGURATION

1/6)
Select transmitter that shall be configured or deleted and press 'Enter'.
The 'Live Transm.ID' is set to 0.

2/6)
Select transmitter type that shall be configured or deleted and press 'Enter'.
The 'Live Transm.ID' is set to 0; the key to be pressed for teaching in the transmitter are updated.

3/6)
If the selected transmitter shall be deleted, press 'Apply' without teaching in a new transmitter.

4/6)
If a new transmitter shall be added, simultanoursly press the following keys on the transmitter:
'Teach Key 1',
'Teach Key 2',
'Teach Key 3'.

5/6)
Check if the 'Live Transm.ID' entry is updated to a value different to 0.

6/6)
Press 'apply' to add the new tranmitter - the entry 'Stored Transm.ID' is updated to the value of 'Live Transm.ID'.
When you are satisfied with ALL the offsets press 'OK' to complete the adjustment.

OK=F3
Repeat=F4
Apply=F2
Cancel=F5

13.10.Adjustment of CS/FS tracking offset



Adjustment_bucky RAD_[Manual]_...

Instruction [Ctrl+F1]
TRACKING CS-WS OFFSET ADJUSTMENT

To perform this adjustment THE X-RAY TUBE MUST POINT TOWARDS THE WALLSTAND AND THE LASER MUST ALWAYS HIT THE SAME POINT.

NOTE: All values marked as 'xxxxxxxxxxxx' are currently invalid.
i.e. The CS is not at a fixed SID or the alpha drive is not rotated correctly.

1/4)
To adjust, move the CS to EACH standard position and line up the laser to hit your selected point in the center of the Wallstand.

2/4)
When the CS is lined up with the Wallstand, press 'Apply' to calculate the new offset.

3/4)
Repeat for every SID and ALWAYS PRESS 'Apply' so the CS offset can be calculated and stored.

4/4)
When you are satisfied with ALL the offsets press 'OK' to complete the adjustment.

OK=F3
Repeat=F4
Apply=F2
Cancel=F5

Section 8

Additional information

Contents

1. Deployment and stowage

1.1. Checklist – deployment

1.2. Checklist – stowage

2. Trainings video CD

3.



LIST OF PAGES AND MODULES

MODULE CODE NUMBER: 4512-983-09321

8-1...8-4 (04.0)

Deployment and stowage

1. Deployment and stowage

1.1. Check list - Deployment

1.1.1. General -- before Power-ON --

- Appropriate environmental conditions (humidity!) ☐
- Center of shelter adequately supported ☐
- Incoming power: 208 Volts AC, 3 phase ☐
- Phase-sequence monitor: OK ☐
- Safety switch in ON position ☐

1.1.2. PCR boxes

- 8 screw / washers between transport rails and boxes unfastened ☐
- 8 screw / washers between transport rails and floor unfastened ☐
- screws / washers and Transport rails removed ☐
- Boxes in designated positions ☐

1.1.3. PCR / EV cabinet (box 3)

- Network cables connected ☐
- Power cord connected ☐
- UPS activated ☐
- Casters secured ☐

1.1.4. PCR / USIT cabinet (box 2)

- Extension lead switched ON ☐
- Network cable connected ☐
- Power cord connected ☐
- Casters secured ☐

1.1.5. PCR Reader (box 1)

- 4 transport lockings in parking position (inside) ☐
- Network cable connected ☐
- Power cord connected ☐
- Casters secured ☐

1.1.6. Printer (box 4)

- Protective foam removed and stowed ☐
- Receive tray inserted ☐
- Film magazine inserted ☐
- Network cable connected ☐
- Power cord connected ☐
- Casters secured ☐
- Power switch ON ☐

1.1.7. Column

- Stoppers at end position ☐
- Column lowered to rail ☐
- Beam limiting device in operating position ☐
- Transport device folded back and screwed to ceiling ☐

1.1.8. Wall stand

- Yellow fastening screw for counter weight removed ☐
- Yellow clamp for cassette tray removed ☐
- Ty-rap from cable hose removed ☐

1.1.9. Operator's shield

- Operator's shield in operating position ☐
- Plastic bag from operation panel removed ☐
- Support for operation panel in operating position ☐

1.1.10. BuckyDiagnost

- Transport frame removed ☐
- Yellow clamp for cassette tray removed ☐
- 17 Plastic floor caps in floor ☐

1.2. Check list - Stowage

1.2.1. General -- before Power-OFF --

- Column is close to bucky wall stand (outside the notches) ☐
- Table-top is in its lowest position ☐
- Mirror of PCR Reader in parking position (by service software) ☐
- Whole system is switched off ☐

1.2.2. PCR Reader (box1)

- Mirror is already in parking position ☐
- 4 transport lockings attached (inside) ☐
- Network cable disconnected and stowed ☐
- Power cord disconnected and stowed ☐
- Transport box properly closed ☐

1.2.3. Printer (box 4)

- Network cable disconnected and stowed ☐
- Power cord disconnected and stowed ☐
- Film magazine removed and stowed ☐
- Receive tray removed and stowed ☐
- Protective foam parts attached ☐
- Transport box properly closed ☐

1.2.4. PCR / USIT cabinet (box 2)

- Extension lead switched OFF ☐
- Network cable disconnected and stowed ☐
- Power cord disconnected and stowed ☐
- Transport box properly closed ☐

1.2.5. PCR / EV cabinet (box3)

- UPS de-activated ☐
- Network cables stowed ☐
- Power cord disconnected and stowed ☐
- Transport box properly closed ☐

1.2.6. Wall stand

- Yellow fastening screw for counter weight attached ☐
- Yellow clamp for cassette tray inserted ☐
- Cable hose fastened with Ty-rap ☐

1.2.7. Column

- Beam limiting device in transport position ☐
- Stoppers in transport position ☐
- Column lifted from rail ☐

1.2.8. PCR boxes

- 8 plastic floor caps removed from floor ☐
- 4 transport rails attached to the floor ☐
- 4 PCR boxes attached to the transport rails ☐

1.2.9. BuckyDiagnost

- 8 plastic floor caps removed from floor ☐
- Yellow clamp for cassette tray inserted ☐
- Transport frame attached ☐

1.2.10. Operator's shield

- Plastic floor cap removed ☐
- Operator's shield in transport position and locked ☐
- Support for operation panel in transport position ☐
- Operation panel protected with plastic bag ☐

This completes the stowage of the Philips BuckyDiagnost IsoRAD system and its accessories. The shelter can now be closed using standard military procedures.



Section 9

Cable and earth diagrams

Contents

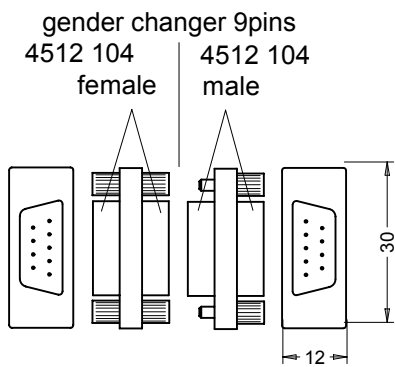
1. Legend for cabling diagram
2. Cabling diagram
3. Earthing diagram
- 4.



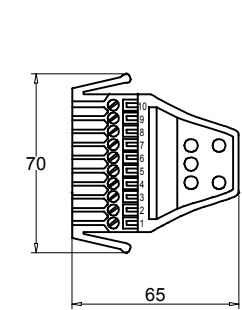
Heading symbols

C	control desk
E	cabinet generator
FS	ucky DIAGNOST Floor Stand
LA	collimator
MEX	wcb generator
S	ucky table for bucky DIAGNOST TH, Segment control unit for bucky DIAGNOST VR or Stand of duo DIAGNOST/easy DIAGNOST
SA	film plane
UA	column (bucky DIAGNOST Floor Stand)
UB	ceiling crane longitudinal carriage (bucky DIAGNOST CS)
UZ	ceiling crane transverse carriage (bucky DIAGNOST CS)
VE/VT	vertical DIAGNOST
VP	wcb vertical DIAGNOST
WS	wallstand
XA	X-ray tube
wcb	wall connection box

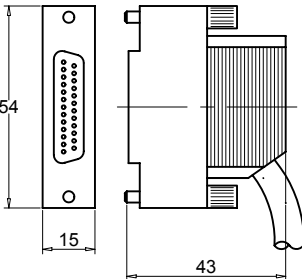
Connectors



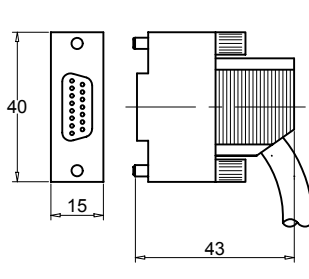
top decade plug
4512 104 0235.



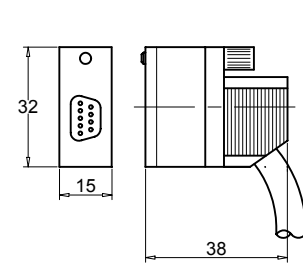
D-SUB 25 pins
2422 025 05039
male



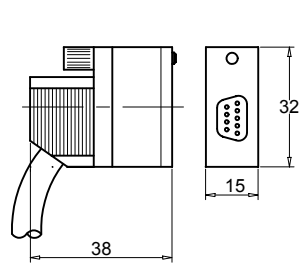
D-SUB 15 pins
2422 025 05038
male



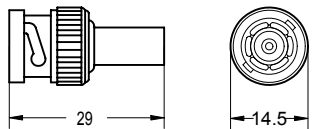
D-SUB 9 pins
2422 025 05456
male



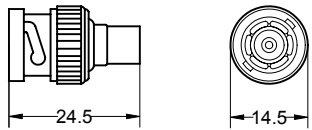
D-SUB 9 pins
2422 034 18334
female



11BNC-connector
2432 020 00272



11BNC-connector
2432 020 00273
2432 020 00369



crimp pin male 2422 034 11636
crimp pin female 2422 034 11632
distance piece (M3, 11mm) 2422 034 20331

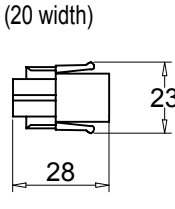
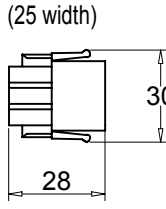
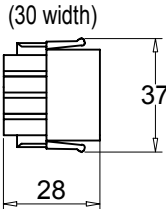
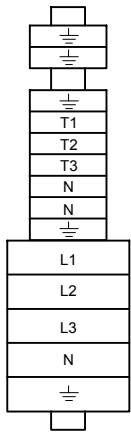
connection block incl.
wall connection box
4512 103 75384

MATE-N_LOCK 12 pins
2422 025 02908
3x4 male

MATE-N_LOCK 3 pins
2422 025 02991
1x3 male

MATE-N_LOCK 6 pins
2422 034 16253
3x2 male

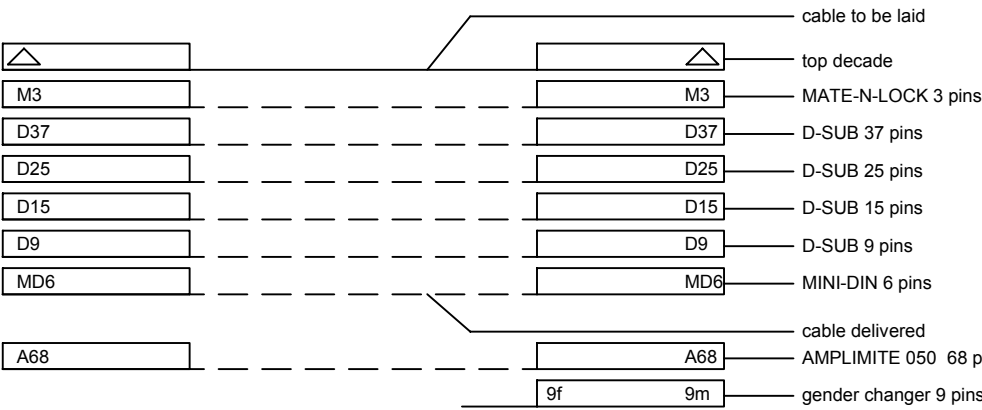
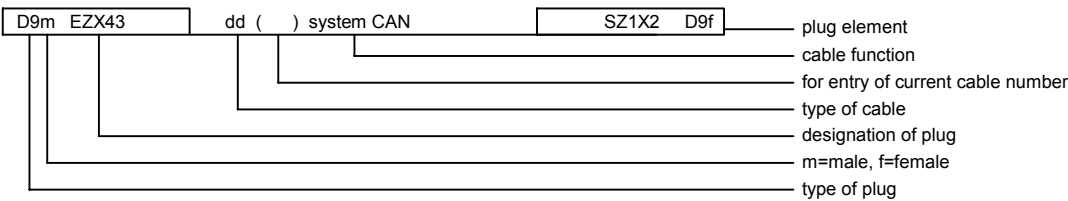
MATE-N_LOCK 9 pins
2422 034 16589
3x3 male



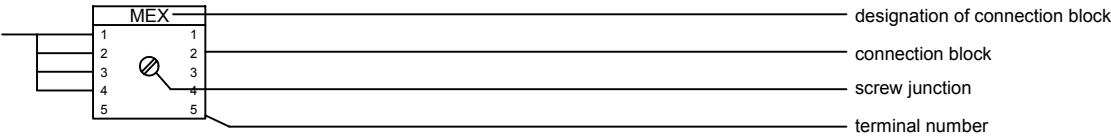
crimp pin female
2422 015 14048

crimp pin male
2422 034 17788

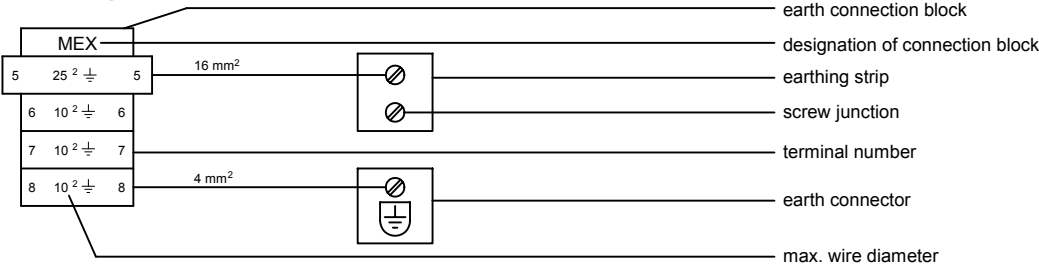
Cable (text) symbols



Connection blocks

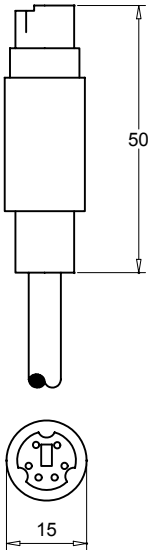


Earthing



PE protective earthing yellow/green wire
FE functional earthing red wire
AE antiinterference earthing

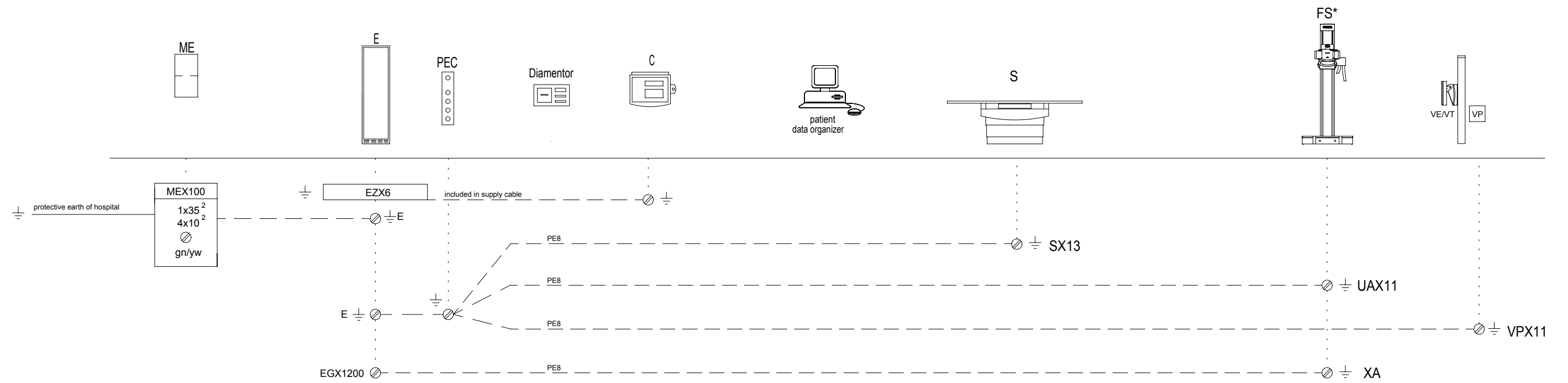
MINI-DIN 6 pin



Cables

Type	Description	Diameter	Codenummer
da	3+1 x 1.38 mm ²	8.0 mm	0722 207 03044
db	3 x 1.3 mm ² screened + yl	9.2 mm	0722 215 02054
dc	2 x 0.8 mm ²	6.2 mm	0722 300 01011
dd	5x2 x 0.22 mm ² screened	7.4 mm	0722 215 62001
de	12x2 x 0.22 mm ² screened	9.6 mm	0722 215 51007
df	10 x 0.5 mm ²	7.3 mm	4512 100 66451
dg	10 x 0.5 mm ² screened	7.8 mm	0722 997 07248
dh	8x2 x 0.22 mm ² screened + yl	8.4 mm	0722 215 33008
dk	8 x 0.75 mm ² screened	9.6 mm	
dm	6x2 x 0.75 mm ² screened	12.6 mm	
dn	2x2 x 0.22mm ² screened com.chan.	5.6 mm	0722 215 29006
do	2x35 mm ²	40.0 mm	xxxx xxx xxxxx
PE16	16.7 mm ²	9.3 mm	4512 100 66131
PE8	8.25 mm ²	6.82 mm	0722 186 005..
H.V.	O3-O3, 150 kV	16.5 mm	9806 402 6xx02
FOL	fibre optic link	2.9 mm	xxxx xxx xxxxx (xx = length in m)

Legend for cabling diagram



Section 10

Packing list

Contents

1.



Section 11

Films

Contents

1. Test exposures

- 1.1. Alignment light field and X-ray field
- 1.2. X-ray field center alignment
- 1.3. X-ray field limitation

2.

